

**Just Switch Off
CORONA:
Covid-19: 21
Facts, Updates**

**Dr. Maheshwar Prasad
Chaurasia**

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DR. MAHESHWAR PRASAD CHAURASIA

**Covid-19 : 21 Facts, Updates & Tips
must to study for safety at home,
travel or workplace**

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by

DR. MAHESHWAR PRASAD CHAURASIA

Chief Medical Officer (SAG),
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ADHYAN

BOOKS

Dedicated to

MY PARENTS

Late Sh. Jagdish Chaurasia,
now in better world,
and

Smt. Savitri Devi

Both of whom made me grow from a zero in village
To where I am today

Declaration:

Proceeds from this book will go to Trust/NGOs
for Social Works.



Bhagwan Shankar, IAS
Addl. Chief Secretary
DPER & NECA Deptt.
(Development and Coordination)
Government of Sikkim

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FOREWORD

I am extremely pleased to know that Dr. M. P. Chaurasia is writing a book on Corona virus and Covid-19.

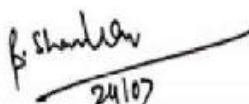
This disease has been sweeping the world and posing threat to human life and the economies of the world. A user friendly reference book on this matter is a dire need of the hour which will provide important information to all stakeholders, viz. patients, doctors, medical staff, managers, administrators, politicians and general public at large.

I have gone through the broad contours of the book and found it very interesting and lucid to read. It provides answers to almost all the queries which one conceives of. It is no doubt a wonderful book on the subject.

I would like to appreciate Dr. Chaurasia for his painstaking work and diligence which has resulted in creation of this book. I congratulate him and convey my best wishes for success of this book.

Dt: 24/07/2020

New Delhi.


24/07
(Bhagwan shankar, IAS)



Dr. Akshay Kumar Mehta
Medical Director

DDU Hospital,
Hari Nagar, New Delhi- 64
Govt. of NCT of Delhi.

FOREWORD

It's a matter of pleasure that Dr. M. P. Chaurasia is writing a book on the problem the world is battling with. Only awareness can change the status and save the humanity from this pandemic.

Dr. Chaurasia has been associated very closely with corona-crisis management since the days of establishing very early quarantine centres in Delhi near IGIA, managing logistics and medical support to Covid Testing centres, Covid Care Centres and Covid Health Centres in addition to the quarantine and isolation centres in adjacent districts as well, along with working in Medicine department of our hospital.

I have gone through the contents of the book and found very informative though in very simple language easily palatable for the readers.

With his persistent involvement in tackling the Covid crisis, I place a great amount of trust and confidence in the contents of his book.

Certainly the readers will be highly benefitted to know all about novel-Coronavirus and win over the crisis. I wish him and his endeavor a grand success.

Dt: 31/07/2020

New Delhi.


Dr. Akshay Kumar Mehta
Medical Director

Preface

This book is particularly written for purpose of awareness of the General Public, people working in offices, malls, markets and hospitality industry, business heads owning them, and the travellers, detailing facts about Covid-19 and the tips to protect themselves from it.

Being posted in the Department of Medicine at Deen Dayal Upadhyay Hospital, Hari Nagar, New Delhi and managing the corona pandemic, heading related sections of hospital as Additional Medical Superintendent has been very exhaustive, working day and night since the first lockdown period of the country. We have been associated very closely with establishing very early quarantine centres in Delhi near IGIA, scanning thousands of passengers brought home from abroad stuck abroad due to aviation restrictions, under Vande Bharat Mission and isolating them in quarantine centres. Later managing corona isolation wards, the 24 X 7 screening centre 'FLUCORNER' along with testing facility at hospital for the general public and extending parental support to the Covid Testing Centres, Covid Care Centres and Covid Health Centres in south west and west districts of Delhi have been our routine and is still continuing with extending support to recently established 10,000 bedded Sardar Patel Covid Care Centre at Radha Swami Satsang Vyas, Bhati Mines, Chhatarpur, a special effort by Govt. of Delhi in association with Govt. of India.

Passing through the difficult time managing these situation and going day by day through the different studies on this newly known Novel Coronavirus 2019-nCoV, later named by WHO as SARS-CoV-2, and different guidelines from ICMR, NCDC, WHO and premier institute AIIMS, has been routine. They have established milestones in the management and preventive measures in patient care and general awareness.

Getting queries from medical professionals as well as general population, near and dear ones, friends and relatives on behavior of coronavirus and relevant aspects of Covid-19 disease has been so frequent that it motivated me to write the different facts, updates and tips on this serial killer virus in the form of a book JUST SWITCH OFF CORONA - with aim to make general public aware and take preventive measures so that this danger to the mankind gets switched off.

Here, I want also to declare that I am writing this book in my personal capacity and my views in this book are personal and not as a govt. servant. And proceeds from this book will be donated to the trust or NGOs for social works.

The facts in the book have been based on the personal experiences and facts verified from WHO, CDC, US NML and ICMR websites. Multiple pictorials and facts have been used from WHO and MyGov Newsdesk, Government of India websites to make the information interesting and factual. Actually these organisations are really doing gigantic task to make the world aware and get free from pandemic. That fact itself further motivated me to do at least my part whatever I can do for awareness of the non – medical general population badly suffering from the eventualities of Coronavirus.

And the experiences and strategies of heads and experts working on ground, fighting corona, have also been shared in book in between related chapters to inspire the readers and office heads. They may replicate the strategies in their organisations and at their workplaces, home or during travel.

I hope my work will be helpful to empower the readers easily with the knowledge behind the complexity of Covid-19 in simpler words. And it will give them easy tips protecting self, and, thereby the community as well.

Aug. 4, 2020 Dr. M. P. Chaurasia

Acknowledgement

The task to write in detail about the ongoing pandemic Covid-19 detailing important things about the virus, its effects, symptoms, essentials about isolation and all about protective gears has been exhaustive and wouldn't have been possible without inputs from different sources.

First of all, I acknowledge all my gurus at my own hospital, where I worked in nineties as resident, Dr. Naveen Kumar, Dr. D. D. Golani, Dr. Ravi Pathak, Dr. Anil Garg and our Ex-HOD Dr. P. K. Pathak, from whom I have imbibed the clinical knowledge and working tactics for difficult situations. At this moment I also remember my alma mater and the then Principal of Darbhanga Medical College Late Dr. KC Brahmu, a legend anatomist, his then colleagues, and all my batchmates of 1985 batch who expressed extra emotions for me during graduation days and have been as extended family.

All our residents and all paramedical and sanitation staff have been the boon for the gigantic task of tackling corona patients and the suspects. They deserve salutes and solicitation.

I acknowledge the WHO, CDC, US NML and NCBI, the National Centre for Biotechnology Information, and Govt. of India websites of ICMR including its NIOH, MOHFW and MyGov Corona Newsdesk for the valuable facts and inputs used in the book for awareness of the general public.

Multiple pictorials and facts have been used from WHO and MyGov Newsdesk, Government of India Initiative. Similarly few pictorials/visuals seen circulating on Whatsapp platform and found impressive as well as informative have also been added in the concerned sections to make the readers understand easily. I acknowledge all such websites, social media platforms and the creators of the wonderful visuals.

I acknowledge the Wikipedia and its founders and participants for the relevant inputs and visuals that otherwise are not available at all.

They are the ones empowering humanity availing facts and history.

A sincere thanks to Outlook India, The Hindu, The Times of India and Twitter which helped me gather crucial informations to share a clear perspective of the different aspects of corona related issues.

I also acknowledge Google and Microsoft to give opportunity to type and draw the manuscript with all the corrections automatically, and being the magic tool for quick search for me and the world. World is not complete now without you and your accessories.

I acknowledge Sh. Bhagwan Shankar, IAS, Addl. Chief Secretary, Sikkim Govt. and Dr. A. K. Mehta, Medical Director, DDU Hospital for the encouraging 'foreword' for the book.

For my book I requested email interviews of some experts and dignitaries to share their views directly to the readers to give them the grass root experiences and they have been kind enough to oblige with inputs. It includes Sh. Rahul Singh, IAS, DM South-West Delhi, Dr. Ajit Shewale, Public Health Specialist, NCDC, Dr. Jyoti Kumar, DGM (CC), GAIL (India) Limited, Dr. Shambhu Nath Chowdhary, District Nodal (Covid), Lohardaga, Jharkhand, Dr. Om Prakash Chaurasia, Gastroenterologist from California, USA; Fellow Radiation Oncology, Dr. Rituraj Upadhyay, MD Anderson Cancer Center, Houston, Texas, USA and celebrated Chef Sh. Saurav Nath from London. I thank all of them for sharing their expertise.

I acknowledge my senior and mentor Dr. Deepak Kr. Upadhyay for taking pain, editing and proof reading the manuscript. Without this, the work wouldn't have completed.

I also thank Dr. Ajay Kr. Sigh, Bhagalpur, Dr. Madan Pd. Srivastav, Lucknow, and Dr. Nayan, Lohardaga, Jharkhand for their valuable inputs. I also thank Dr. Dadan Pd. Chaurasia, Dr. Sujeet Kr. 'Gayak', Dr. Anuj Kumar, Dr. Shailesh Kr. Singh, Dr. Santosh Kr. Pandey, Dr. Ravish Kr. Verma, Dr. Sunil Kumar, Dr. Mati-ur Rehman, Dr. Omair-ul-haq and Dr. Jai Prakash Prasad for being associated with me as extended family.

The patients and their attendants coming to hospital have been giving

us the chance to serve. They energized and motivated me to write the book. I am indebted to all of them too. I wish the book help them more.

And acknowledging Sh. Nitin Soni, Adhyyan Books and all the supporting team members including Elizabeth, Meenakshi and Ganeshji, is must for me without whom my dream of writing book would not have come true.

And finally, my sincere and heartfelt message to my family, I am indebted to my sons Anubhav and Manuj, and my wife Pratima for all their support and constant motivation to keep myself focused, devoting my sleeping hours to writing book until 3 am mornings as I have continuously been on routine hospital duties in days since beginning of corona crisis without any leave.

Aug. 4, 2020 Dr. M. P. Chaurasia

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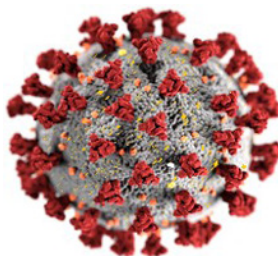
INTRODUCTION OF THE SERIAL KILLER

A virus is very minute infectious agent that can't be seen by simple microscope like bacteria. They are very small in size, ranging from 0.02 to 0.4 μm (micrometer) in diameter ($1 \mu\text{m} = 10^{-6}$ meters) and can be seen only by electron microscope. (By contrast, the smallest bacteria are about 0.4 μm .)

Virus replicates only inside living cells of an organism and can infect all types of life forms, from animals and plants to microorganisms including bacteria.

Coronaviruses, varying in size from 0.065 – 0.125 μm , are not new and have been around since long causing respiratory tract infections in the birds and mammals. In cows and pigs, it has been causing diarrhea, in chickens upper respiratory tract infections; in humans ranging from mild infections resulting in the simple common cold, fever and cough to the fatal pneumonias and Acute Respiratory Distress Syndromes.

These coronaviruses are enveloped virus with a single helical stranded RNA genome.



Source: Wikipedia

They have characteristic club-shaped spikes that project from their surface (fatty outer membrane), which on electron microscopy, gives image similar to the solar corona (crown). So they are called

CORONAVIRUS.

But the fatty outer membrane is very fragile. It breaks apart when it meets soap and water, that is why washing the hands with soap and water is advised as a PREVENTIVE MEASURE.

First of its types was discovered way back in 1930 in chickens, whereas coronaviruses affecting humans (Human Coronaviruses) were discovered in 1960s with major breakthroughs going on since then. There are multiple variants and all having their genetic materials embedded in RNA (ribonucleic acid). Before the present SARS-CoV-2 outbreak, coronavirus was known only for mild respiratory infections in the people. Focus has shifted to this dreaded variety of Coronavirus only after the outbreak of respiratory illness in Wuhan City, Hubei Province, China, spreading later to Germany, Italy and so on, and has spread now world over.

Human Coronaviruses

Researchers have separated human coronaviruses into four sub-groupings, called alpha, beta, gamma, and delta. Seven of these human viruses, mostly from alpha and beta sub-groups, have been found infecting human. Four of them infecting human more commonly are 229E(alpha), NL63(alpha), OC43(beta) and HKU1(beta). The three rare ones have been seen causing outbreaks in last two decades:

1. SARS-CoV (SARS-CoV-1) - a beta virus, caused Severe Acute Respiratory Syndrome (SARS) outbreak in 2002-2004. Emerged in China in 2002, within few months spread worldwide, however, was contained quickly.
2. MERS-CoV - a beta virus that caused Middle East Respiratory Syndrome (MERS), first reported in Saudi Arabia 2012, causing endemic in Middle Eastern countries.
3. SARS-CoV-2, a beta virus, not ever seen earlier before its appearance in Wuhan during Nov. - Dec. 2019, this newer strain of human Coronavirus also causing Severe Acute Respiratory Syndrome but with very high transmissibility, infectivity and

mortality than earlier ones. The outbreak started from the Hunan seafood market (of live animals) in Wuhan city of China and rapidly infected more than 50 peoples. Being it a new virus, so it came to be known as 2019 novel Coronavirus, 2019-nCoV as it got first identified only in the end of 2019 in Wuhan city of China, may be traced back earliest to Nov. 2019. Later, on February 11, 2020, WHO named the virus SARS-CoV-2 and the disease caused by it was named as Covid-19 ('Co'rona 'vi'rus 'd'isease-20'19'), declared later as Pandemic.

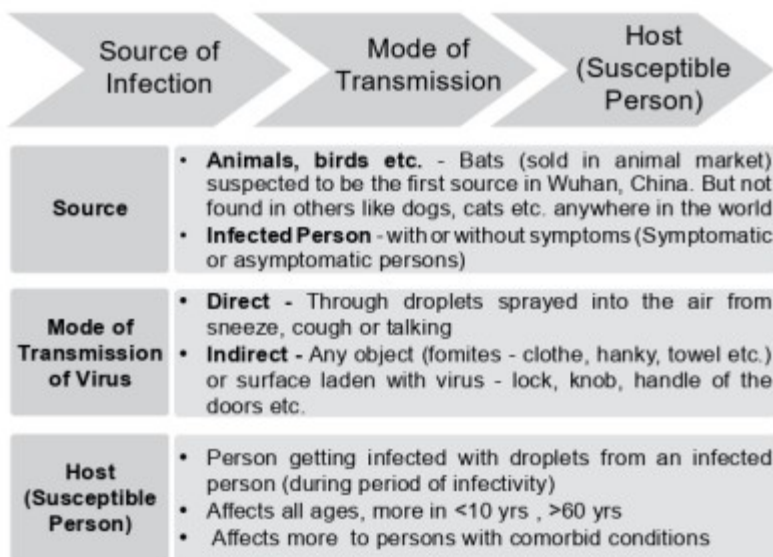
It has been on killing spree since Nov. 2019. Before this, H1N1 influenza was a pandemic in 2009 and which was controlled very soon.

FACTS ABOUT THE KILLER COVID-19

How it is transmitted

Spread of Covid-19 virus is basically through the droplets of cough/sneeze. It's a fact that it is not air born, never happens without droplets from a patient. But how is it transmitted?

Always there are 3 links in chain of transmission of an infection—and the facts of Covid-19 are here –



An event of infection occurs when the virus transmits from a source to a host through any mode of transmission – either through droplets directly or indirectly due to touching your nose/mouth by your infected fingers just after use of fomites or touch of surfaces infected with droplets (from an infected person).

How the infection occurs

To make the understanding of the infection process in little detail, you should know the requirements for an event of infection –

Source (Patient) – Persons infected already with virus (from animals, birds or other person).

Agent – Any microorganism which causes the infection. Causative agent for corona is the human coronavirus - SARS-CoV-2. These are very minute, varying in size from 0.065 – 0.125 μm (micron or micrometer).

The Host - Person at receiving end; person susceptible for infection. Any person with low immunity (body's defense power to fight infection) or comorbid conditions has high chances of infection.

Conditions of low immunity are –

- Patients diagnosed with cancer disease,
- Patients undergoing chemotherapy,
- Immunosuppressed patients – patients of tuberculosis, HIV etc.,
- Transplant patients,
- Elderly patients (> 65 yrs. of age).

Comorbid conditions are -

Patients of lung disease, heart disease, liver disease, kidney disease, diabetes, neurological disorders, blood disorders etc.

The portal of entry of the virus into the host is his/her respiratory tract i.e. through the nose and throat down to the lungs. Viruses (in droplets) are breathed in through nostrils or mouth, resides and multiplies first in throat and as number increases, passes down with throat secretions to the lungs where it may further damage the lung tissues leading to respiratory failure and death. However, spread of droplets directly to eyes may directly infect the eyes also.

Droplets - The virus spreads from person to person or group of persons mainly through the small droplets spreading out from mouth and nostrils during coughing, sneezing, spitting, talking or singing. These droplets are nothing but moist air mixed with the viruses (present in nasal canal, throat or lungs). Few viruses may be present in the breathed out air even during normal (shallow) breathing or normal whispering or talks.

Respiratory infections can be transmitted through droplets of different sizes: when the droplet particles are >5-10 μm (micrometer) in diameter they are referred to as respiratory droplets, and when they are <5 μm in diameter, they are referred to as droplet nuclei.

According to the current evidences, COVID-19 virus is primarily transmitted between people through respiratory droplets.

How droplets/virus work - If someone infected with virus coughs or sneezes near you, he/she coughs out/sneezes a cloud of droplets having loads of viruses. If you unluckily inhale even just a few hundred particles, they could get into your throat and will immediately start invading the cells of the throat.



Cloud of droplets after sneezing

How the virus infect - The virus, by virtue of ability of its spike to get attached to the ACE receptors present on the human cells (of nostrils, throat, lungs, blood vessels, heart, kidney and intestines), it gets attached and slips inside the cells, releases its genetic material RNA, gets itself copied in plenty and releases copies out of the cell again to infect more cells. It does it so speedily that with each passing day, the virus multiplies itself a million fold.

A very high viral load in the throat at very outset of symptoms suggests the person is infectious very early even before he/she is aware of being ill and gets symptom of fever/cough.

Viral load - The loads of virus in the droplets depend on the abundance of virus in the throat, trachea, lungs or body as a whole, of the person suffering from a viral infection. It is detailed in a separate chapter.

How much distance droplets may travel - The distance up to which the sneezed/coughed out droplets travel depends on the intensity with

which a person sneezes, coughs, laughs, sings or talks. Once sneezed/coughed out, the droplets usually fall down to the ground or any other surface within 30 – 60 cm rather than travelling through air for long distance. Hence, social distancing of at least one meter is advised to protect one to get infected from anyone around. However droplets may travel more up to 2 meters if sneezing is forceful. Or, if you are moving on behind someone infected who is also moving but has sneezed or coughed just before, and so you will then come within half of a meter of his droplets just falling down then. So the social distancing of 2 meters is the safest option.

FOMITES - Yes, droplets may travel any distance indirectly through FOMITES i.e. the tissue, clothes, hanky, towel or anything likes which may have been used by the patient to cover the face or nose while sneezing/coughing. Or, droplets may get first transferred from nose and mouth of the patient to his own hands/fingers (on using hand as cover after sneezing) and then again, transferred by touching, to any objects like the locks and keys, knobs or handles of the doors, newspapers, file covers etc. or other surfaces (metallic, plastic, wooden or earthen) which later is touched by other person who may get infected unknowingly, by touching his nose, face or eyes; the virus then getting its entry.

So, **just to summarize:** The coronavirus spreads from an infected person to another person coming in close contact; directly through droplets of cough or sneeze or through infected fomites. And the gravity of infection depends on the load of virus.

RESPONSE OF BODY: IMMUNE SYSTEM

Development of Immunity-

Virus is an antigen (foreign body) for our body. And so body of the infected person naturally starts a response forming antibody against that antigen. This is called developing immunity by the immune system of the body. Antibody starts appearing in blood circulation on 3th to 4th day of infection, being in maximum strength on 11th to 12th day. Viral presence disappears thereafter if the person's immunity system is quite good.

Infection process extends more if person has low immunity level or any comorbid condition like diabetes, kidney disease, old respiratory diseases, any cancer etc.

Overreaction by the Immune System

In few persons, by virtue of their inborn defense property, their immune systems overreact to the presence of antigen (viruses). This result in a massive release of cytokines (immune proteins) called **Cytokine Storm**; severely affecting the balanced internal bleeding-clotting system. This may lead to clots in blood vessels, traveling to the lungs and other organs; severely damaging the functions of lung, heart, brain and kidneys. Obviously such events may quickly lead to multi-organ failure and death.

Exactly this has been observed happening in few of the Covid-19 cases usually on 7th or 8th day of illness, signaled by sudden sharp rise in fever $>102^{\circ}\text{F}$, severe breathlessness requiring urgent breathing support by ventilator, low or non-recordable blood pressure, reduced or no urine output, altered sensorium or unconsciousness.

Situation is very grave and may lead to death. Only recently it has been studied that low dose dexamethasone or other corticosteroids, if

started earlier, significantly control the possibility of cytokine storm and lowers the risk of death significantly. Clinicians treating covid-19 cases have already started this along with anti-coagulant.

KNOW THE POSSIBILITIES OF INFECTION AND SYMPTOMS

(This chapter details the possibilities of infection, different symptoms and criticality & post-recovery complications; and effects on smokers.)

Period of infectivity –

Virus is present in the nasopharynx/throat of the infected person **from 1 to 2 days before onset of the symptoms (sore throat, fever etc.) and up to 1 to 2 days after the symptoms disappear.** The period before symptom appears is called pre-symptomatic period. And symptom of covid-19 may continue for two weeks; rarely even more than 2 weeks.

So, **period of infectivity**, the period during which infected person can spread virus to others, totals usually 14 days from the next day of contact (with an infected person); but rarely may extend up to 21 days if symptoms take time to disappear.

It is most contagious (possibility to get spread to others) during the first three days after the onset of symptoms in the infected person.

However, as explained above, spread is even from those infected persons who do not show any symptoms but carry viruses in their nasal cavity and throat, called **ASYMPTOMATIC CARRIERS**. They are the **most dangerous ones spreading viruses silently** in the society, meeting people here and there freely, unknowingly.

Incubation Period –

It is the time period between invasion (entry into host) by the infecting agent (virus) and appearance of the symptom of the disease. It is usually 5 to 6 days, however can be up to 14 days. During this period also, known as the 'per-symptomatic' period, infected persons may be spreading virus, on coughing, sneezing, talking etc.

Symptoms of the disease Covid-19 –

Symptoms begin to appear on 2nd to 3rd day of infection. Early signs start with fatigue and myalgia (muscle pain) to be followed commonly

by clear symptoms - fever, cough, cold and sore throat; occasionally shortness of breath; and rarely, may lead to respiratory failure and death.

Primarily the symptoms of cough, cold, fever and sore throat are seen in common flu i.e. influenza, so any illness showing these symptoms are called **Influenza-like-illness (ILI)** until proved otherwise by confirmatory tests.

Based on severity of symptoms and assessment, **ILI** or confirmed **covid patients are categorized clinically**, for treatment purposes, into:

1. **Asymptomatic Cases** – Nearly 5 -10% of patients reported positive for SARS-CoV-2 by virological test – rRT-PCR or rapid antigen test but not having any symptoms. They have viruses present in throat and may spread to anyone.

2. **Mild Cases** - Most of the corona virus affected persons (>80%), fall into this category. Symptoms are -

- fever,
- sore throat,
- cough – dry or with expectoration (sputum),
- malaise,
- headache,
- Only occasionally nasal congestion (cold); sneezing, and
- Anosmia (absence of sense of smell) rarely.

These symptoms usually continue for 4 – 5 days, fever continuing with one spike (rise) daily; not rising more than 100 – 100.5°F; and then subside. In few cases, symptoms subside 8th day onwards, completely ending by 11th day. In rare cases, mild fever has been seen continuing upto 21 days followed by full recovery; without any complications.

On assessment, there is no sign of breathlessness or hypoxia (lack of oxygen). Saturation of oxygen, SpO₂, is quite normal (95-100%). And may be managed at home, or a primary level, covid care centre made for those having no room with toilet facility to be separate from other members of family for isolation at home. .

3. Moderate Cases - Less commonly, in nearly 10% of positive cases, the disease progresses further. So -

- fever may continue as mild, or may rise,
- pt. may continue to cough out sputum,
- Viruses infecting lungs, causing pneumonia leading to mild breathlessness, but no signs of severe disease; with decline in the oxygenation capacity of the lungs. SpO₂ may fall between 92 - 95%. (In child <94%)
- Respiratory rate (RR) is usually not >22/minute.

These patients may be managed easily with oxygen at a secondary level, covid health centre, isolating the person, along with other supporting treatments.

4. Severe Cases – Nearly 5% of all covid cases fall under this category as condition of half of moderate cases worsens to severe breathlessness; may lead to ARDS (acute respiratory distress syndrome) requiring ventilator support. They show -

- Signs of pneumonia, plus, one of the next -

- Respiratory rate (RR) > 30/min,
- Severe respiratory distress, or
- SpO₂ < 92%.

5. **Critical Cases** – About one third to half of severe cases turn to the critical situation, due to severe injuries to lung and other organs perhaps due to cytokine storm explained earlier, showing signs of -

- Covid-19 associated coagulopathy,
- Respiratory failure,
- Hypothermia or hyperthermia (high temp.),
- Low or non-recordable BP (septic shock),
- Multiple organ failure.

Almost all of these critical cases need breathing support by machines called ventilator. Few critical cases, may be managed, by portable ventilators or Bi-PAP (Bi-level Positive Airway Pressure), delivering pressurized air through a mask. Condition is fatal with very high mortality.

Post – Recovery Complications

Few Covid-19 positive patients after recovery from symptoms have reported to hospitals with different complications – mild to severe muscle weakness, strokes, heart attack and life threatening clots in blood vessels. In some cases, comorbid conditions like diabetes, hypertension etc. - have worsened.

How much Covid-19 affects smokers

Smoking, e-cigarettes, smokeless tobacco, pan masala, water pipes or hookahs and the like products increase risk and severity of lung infections as it damages upper airways and lungs and decreases immune function. As virus also primarily attacks the lungs, experts have confirmed smokers develop severe symptoms or die from COVID-19.

Smokers are more vulnerable to COVID-19 as smoking involves fingers, possibly contaminated cigarettes, water pipes or hookahs; and contact with lips increasing the possibility of transmission of virus from hand to mouth.

COVID 19 TESTING - TYPES, PURPOSE AND THE TIME TAKEN TO GIVE RESULT

To know a person is suffering from SARS-CoV-2 virus infection – Covid-19 disease, it is imperative to search the presence of virus in the body. And as discussed earlier, its entry in body is through the respiratory airway. Hence, its presence is in abundance in the nasal passage, from few in front to much at its end in throat. Posterior most part of the nasal passage is called **nasopharynx** which opens into the **throat**. Only after passing through these areas, the viruses then may travel along with posterior nasal secretions down to trachea and lungs.

The multiplication of coronavirus is so fast that symptoms of fever, cough or sore throat may start at approximately 3rd day onwards. By then, immune (defense) system of the body starts producing **antibody** in blood stream – the instant antibody called **IgM**, and later on, permanent or may be called late antibody **IgG** which lasts long and gives protection to further infection. However, for how long the IgG lasts is not known as disease is still only 6 month old to study.

Virus after travelling through trachea (lower airway) passes to its prime target organ lung and its surroundings; later may traverse to heart, brain, kidney and other areas. Accordingly, virus may be found in tracheal/bronchial secretions, lung tissues, effusions there, around heart and in other organs and tissues.

Based on the above facts, followings are the tests to confirm presence of coronavirus –

- Covid-19 RT-PCR or rRT-PCR – **It is the gold standard test for confirmation**, done by a real-time reverse transcription polymerase chain reaction (rRT-PCR) to detect the nucleic acid RNA of SARS-CoV-2 in the samples from respiratory

tract areas – nasal/nasopharyngeal or throat swabs, sputum, suction fluids from lower respiratory tract, broncho-alveolar lavage, and also pleural or peritoneal fluids or serum. It may also be tested in urine or stool sample. Average time taken is around 4-5 hours from receipt of sample to getting the result. However due to high no. of tests, reporting results may take between 24 - 48 hours.

However this test requires specialized laboratory setup with specific biosafety and biosecurity precautions not available in all districts of India or many other countries.

•

TrueNat and CBNAAT tests also use similar principle of testing using nasal or throat swab samples and have been deployed in many states in view of their availability in most districts and primary health centres as these are widely used for diagnosis of tuberculosis and other infectious diseases. These methods give result in 30 - 60 minutes but only 1-4 samples can be tested in one run, limiting the maximum numbers that can be tested to 24 – 48 samples per day.

The viral lysis buffer that comes with the COVID-19 cartridges inactivates the virus and poses minimum biosafety hazard. Safety is further augmented by the closed nature of these platforms and minimum sample handling. These features have facilitated use of these platforms at grass root level – primary health centres and district hospitals.



Taking sample from nasopharynx (nasal swab)
Portrayed by Dr. Deepshikha, Deptt. of Medicine, DDU Hospital.

•

Rapid Antigen Test – Also known in India as **Standard Q COVID-19 Antigen Test**, detects presence of antigen (virus) in nasal or throat swab. It does not require a specialized machine and can be interpreted with a naked eye so very useful in field settings. Result is ready within 15 minutes. It is very specific and confirmatory of covid-19, and so very important for early diagnosis and treatment for surveillance of a large area.

However it may give false negative results. So a positive test should be considered as a true positive whereas all symptomatic individuals testing negative through the rapid antigen test should be confirmed with a real-time PCR test.

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Rapid Antibody Test – to detect presence of IgM and IgG antibody in blood sample. Result of this test is also available within 15 minutes. However, it indicates person was infected earlier and have now developed antibody against the corona virus. Done for the purpose of surveillance of an

area or a state to know the immunity developed in community (herd immunity) against covid-19 which is important for planning further for containment of this fatal disease.

However ICMR has strictly advised to use IgG based ELISA and CLIA assays only for conduct of serosurveys in India.

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ELISA for IgG for SARS-CoV-2 – It is Enzyme-linked immune assay test – a detailed study for knowing the presence of IgG antibody in blood sample of the patient against the virus. Again important for surveillance for presence of herd immunity but takes time of 12 – 24 hours for reporting result.

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CLIA assay detects IgG or IgM antibodies by Chemi-luminescence Immune-assay method. However, ELISA is used mostly as is available in institutes and tertiary hospitals.

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Chest X-rays may be conclusive if showing infiltration (confirming pneumonia) in presence of clear symptoms and history of contact with confirmed Covid-19 case.

-

CT Chest imaging may be of help if chest X-ray is not conclusive and there is a high suspicion of infection based on symptoms and risk factors.

There are advisories and guidelines from the governments on modalities of tests depending on timings the patient presents after onset of symptoms.

Along with initial treatment advice, the person with flu-like symptoms coming to the clinician is advised first to get

tested. Treatment later depends on the report whether patient is found negative or positive for covid-19.

Accordingly, persons found infected with corona virus may be advised, in addition to prescription of medicines, isolation at home or in a covid care centre and rules of safety of Do's and Don'ts. Home isolation will be discussed in a separate chapter on aspects of isolation.



Track, Trace, Test

Finding the place and people infected and testing them can be done through this chain of track, trace, and test. This can contain the spread of COVID-19. All three parts are equally important.



Source: #MyGov Corona Newsdesk, Government of India

Earlier rRT-PCR was the single test available. With advent of Rapid Antigen Test, now the larger numbers of patients with flu-like symptoms are managed easily as it gives result in 15 minutes.

Testing Strategies

Since **Test, Track and Treat** is the only way to prevent spread of infection and save lives, it is imperative that testing should be made widely available to all symptomatic individuals in every part of the country, and contact tracing mechanisms and isolation strategies for containment of infection spread are strengthened. In India, ICMR advises all

concerned State Governments, Public and Private Institutions to take required steps to increase testing for COVID-19 by deploying combination of various tests.

Test of a Corona Suspect

(Which test for whom?)

The decision of test should be based on clinical and epidemiological factors (prevalence of corona cases in an area) and linked to a possibility of the likelihood of infection.

Tests In a non-corona affected area (Virgin Area)

Covid Testing of a person with
Flu-like symptoms



Every such person, during this pandemic period,
is a corona suspect



RT-PCR for Covid-19

is only the gold standard test to confirm corona,
apart from routine tests to rule out other causes.

(Sample – nasal and throat swab)

Tests In a corona affected area (Covid Cotainment Zone)

**Persons identified with Flu-like symptoms
(Fever, cough, cold, sore throat)**
(Advised Home quarantine for 14 days)



Rapid Antigen Test



POSITIVE

Negative



Confirmed
Covid-19



rRT-PCR



Negative

Positive

(Sample–nasal and throat swab)

If after negative rapid antigen test, rRT-PCR comes positive; again it's a confirmed case as rRT-PCR is test for detection of nucleic acid of coronavirus.

The containment zones/areas are decided by the district authorities based on the extent of cases/contacts listed and mapped by them. The area may be demarcated of upto 3 Km radius around the epicenter (the residence of the positive case) or in case of group housing societies may be the whole society sealed for testing.

A buffer zone of an additional 2 Km radius – totaling to 5 Km radius from epicenter (7 Km in rural areas) are also identified, as detailed in the cluster containment plan.

Full Micro Plan for Containing Local Transmission of Coronavirus Disease (COVID-19) may be seen on the website of Ministry of Health & Family Welfare, Govt. of India on the following link on Google:

<https://www.mohfw.gov.in/pdf/ModelMicroplanforcontainmentoflocaltransmissionofCOVID19.pdf>

For benefit of the readers belonging to the containment zones and those admitted in healthcare settings, recent advisory of the ICMR for testing is being given here.

ICMR ADVISORY

Newer Additional Strategies for COVID-19 Testing

(Dated: 23/06/2020)

Use of Standard Q COVID-19 Ag test - a point of care diagnostic assay is recommended in the following settings in combination with the gold standard RT-PCR test:

A. Containment zones or hotspots (to be performed onsite under strict medical supervision and maintaining kit temperature between 2°-30° C):

- i) All symptomatic Influenza like Illness (ILI).
- ii) Asymptomatic direct and high-risk contacts with co-morbidities

(lung disease, heart disease, liver disease, kidney disease, diabetes, neurological disorders, blood disorders) of a confirmed case to be tested once between day 5 and day 10 of coming into contact.

B. Healthcare settings (to be performed onsite under strict medical supervision and maintaining kit temperature between 2°-30° C):

i) All symptomatic ILI patients presenting in a healthcare setting and are suspected of having COVID19 infection.

ii) Asymptomatic patients who are hospitalized or seeking hospitalization, in the following high risk groups:

- Patients undergoing chemotherapy
- Immunosuppressed patients including those who are HIV + ;
- Patients diagnosed with malignant disease;
- Transplant patients;
- Elderly patients (>65 yrs. of age) with co-morbidities (lung disease, heart disease, liver disease, kidney disease, diabetes, neurological disorders, blood disorders).

iii) Asymptomatic patients undergoing aerosol generating surgical / non-surgical interventions:

- Elective/emergency surgical procedures like neurosurgery, ENT surgery, dental procedures etc.
- Non-surgical interventions like bronchoscopy, upper GI endoscopy and dialysis etc.

***ILI case is defined as one with acute respiratory infection with fever $\geq 38^{\circ}\text{C}$ AND cough.**

Use of the rapid antigen test is recommended in A & B categories above subject to the following conditions:

- i) Should be interpreted between 15 to 30 minutes with a naked eye. No interpretation should be made before 15 minutes or after 30 minutes.
- ii) Symptomatic individuals who test negative for COVID-19 by rapid antigen test should be definitely tested sequentially by RT-PCR to

rule out infection, whereas a positive test should be considered as a true positive and does not need reconfirmation by RT-PCR test.

- iii) Samples (only nasopharyngeal swabs) to be collected by a trained healthcare worker following full infection control practices including use of proper PPE.
- iv) The test should be conducted onsite under strict medical supervision and within one hour of sample collection in extraction buffer.

The district authorities all over India are advised by the Govt. of India, Ministry of Health & Family Welfare to follow the above advisory.

Test for Herd Immunity

Area prevalent with large no. of positive Covid-19 cases



Rapid Antibody Test or Elisa for IgG
of large no. of persons in area (**Serosurvey**)
(**Sample – blood**)

Serosurvey shows how much prevalent is the Covid-19 infection in an area. Higher the population found positive for antibody test indicate there was higher no. of cases including asymptomatic cases.

And this shows large no. of persons of area would have developed immunity to the disease. This is called herd immunity or community immunity.

If the herd immunity is less, peoples are vaccinated to develop active immunity. For most of communicable diseases if level of community immunity is found developed in more than 80% of population, then that area is called to be safe. Cases of further infection in those areas are only occasional and non-fatal.

TURNING TO WIN OVER Covid-19

How Delhi Govt. Showed the Way

The COVID-19 pandemic is the largest public health crisis being faced by the modern world. In the first week of June, Delhi was witnessing rising number of cases prompting alarm. However, after a month, it appears to have plateaued.

The positive steps that the Delhi government has taken to contain the spread successfully may be taken as model:

1. Aggressive testing and contact tracing initiative - In the first week of June, Delhi government was conducting nearly 5,500 tests per day. With the help of Centre's support providing antigen test kits, by mid-June, this figure rose to 11,000 tests per day and by first week of July, crossed 21,000 tests per day. This much testing reflected very high figures of cases, but isolating thousands of reported positive patients and their families every day turned the situation into a success.
2. Promoting home Isolation of COVID-positive patients who were asymptomatic and had mild symptoms – along with ensuring medical help and consultation for such patients. Getting medical help allayed anxiety and kept them confident and happy in a homely atmosphere.
3. Providing Pulse-Oxymeter to all patients in Home Isolation - Delhi Govt. provided oxymeter to all patients in Home Isolation, so that they could monitor their oxygen levels and on finding sudden fall, may be transferred to hospital timely.
4. Increasing the number of beds in hospitals and real-time online information on bed availability – Number of 700 beds for Covid-19 patients in private hospitals in June 2020 was increased to 5000 in addition to 2500 beds in Delhi Government hospitals when the cases started rising and many people preferring private hospitals. And real-time online information through 'Delhi Corona App' added the ease to

patients in need of hospital bed. In addition, linkage of hotels to hospitals raised further beds in private hospitals from 5000 to 7000. Today, over 15,000 Covid beds are there in Delhi. Setting up of 10,000 bedded Sardar Patel Covid Care Centre in Chhatarpur in association with Govt. of India has added the numbers to quite safe position.

5. Raising the ambulances Strength – From the strength of 134 ambulances at the beginning of lockdown, government's own CATS ambulance service now operates fleet of 602 vehicles catering to both COVID and non-COVID cases in addition to non-emergency calls.

Direct Public Engagement by the Chief Minister himself, Deputy Chief Minister and the Health

Minister with the people of Delhi through TV Channels explaining Home Isolation, increasing hospital beds, importance of oxymeter in preventing death, how oxymeter being made available, and why plasma should be donated; and **Setting up the country's first Plasma Bank in Delhi** facilitating easy access for convalescent plasma has meant a lot for Delhi residents. People have always been kept informed and encouraged by a trusted voice showing ability to confront the Corona – crisis.

HOW TO BE SAFE: THE SAFETY RULES

Current evidences suggest that SARS-CoV-2, the virus that causes COVID-19, is predominantly spread from person-to-person. Hence, globally, the Strategic Preparedness and Response Plan to control COVID-19 is by suppressing transmission of the virus and preventing associated illness and death.

Pandemic will disappear only after at least 80% of population feels herd immunity or there is vaccine available to vaccinate the majority of population. And that will take time. Herd Immunity is the situation when immunity develops in society (larger no. of persons) against a disease. That creates break in chain of infection spreading from one to all easily. Similarly, vaccination produces very, very mild infection leading to appearance of immunity itself as happens after a direct droplet infection. That possibility is also far away, at least one year. Till then, the coronavirus would have taken millions of life.

Survival of the fittest

Till then, we must remember the most famous ‘Survival of the fittest’ mantra, explained in detail in his book “The Origin of Species” by Charles Darwin, British naturalist and biologist, which suggested that only the organisms best adjusted to their environment are most successful in surviving.

So keeping in views the points earlier explained in the first and second chapters, the only ways of breaking the chain of spread of virus are – **The Safety Rules of DOs and DON'Ts.**

DOs

- 1) Wash hands with soap and water frequently. Remember to make froth adequately, for atleast 20 seconds, upto the wrist of your hands or above, as it is only froth of the soap and water that breaks the lipids in outer envelope of coronavirus killing it

instantly. Using soap without making froth is of no use. Alcohol based sanitizer is alternative, but that should also be used in the same way rubbing between hands and fingers and its outer surfaces, upto wrist;

- 2) Maintain social/physical distancing of at least 1 meter everywhere; If possible, keep it 2 meters;
- 3) While sneezing or coughing, cover the face with tissue or with your folded elbow (if no tissue), and
- 4) Avoid contact to the person having symptoms of cold or flu (fever, sneezing, sore throat etc.).



Remember to make froth adequately upto your wrist while washing your hands with soap and water

DON'Ts

- 1) Do not go to crowded place,
- 2) Do not gather in a closed/confined space,
- 3) Do not cough or sneeze in open.
- 4) Do not touch or handshake anybody.
- 5) Do not touch your nose, mouth or your eyes with unwashed hands.
- 6) Do not spit in open. It may infect others.



Source: #DefeatCoronaVirus at MyGov Corona Newsdesk, Government of India

Obeying these rules by the general public as well as by the infected persons is only the way to keep one and all safe from the events of serial infections.

The best way to save lives during the period of Covid-crisis has been nicely summed up as –

Stay Home, Stay Safe.

And

Stay Home, Save Lives.

VIRAL LOAD AND ITS SIGNIFICANCE

(This chapter makes you understand why some family shows spread in all while in other cases only one is infected, not others.)

The loads of virus in the droplets depend on the abundance of virus in the throat, trachea, lungs or body as a whole, of the person suffering from a viral infection. And so, spread of virus to another person, present nearby, is accordingly.

In another way, viral load also refers to the quantity of a virus in an infected person and indicates how quickly the virus is replicating in their body after getting infected.

The ICMR, Indian Council of Medical Research, after its study, took initiative that the Covid test should track viral load too. As per its study, reported in media and journals, only seven per cent of samples for coronavirus testing have a “high viral load” — meaning these people would, on an average, transmit the infection to 6.25 other people. The vast majority (84%) have a low viral load i.e. low infectiousness, transmitting only to 0.8 persons on an average. Nearly nine per cent have a moderate viral load.

These were new findings by ICMR’s National Institute of Occupational Health (NIOH), Ahmedabad, based on a study on over 1,000 samples collected and tested in the state in the month of April and May 2020. The result underlines the need to include viral load figures in Covid test reports.

This assumes significance as many of those tested positive are asymptomatic.

With these assumptions, if persons with high viral load, ‘super-spreaders’, are quarantined compulsorily, a large population may be prevented from getting infected.

So, viral load is a very strong determining factor. **Few people may be spreading most infections and most people may spread very few infections.**

One indicator of viral load is ‘Ct value’ or cycle threshold value.

Technically the rRT-PCR testing for Covid-19 uses fluorescent signals to detect nucleic acids of SARS-CoV-2. The 'Ct value' is the number of cycles required in the PCR machine, for the fluorescent signaling, to cross the base level of the machine. A high value, therefore, means a low viral load and vice versa.

With this Ct value, viral load may easily be known to be high, moderate, or low. If used further for surveillance planning by authorities, this may change the scenario.

HOW IT SURVIVES: WHERE AND FOR HOW LONG

Coronavirus SARS-CoV-2 spread from person to person mainly through respiratory droplets produced when someone with the virus talks, sneezes or coughs near you and the droplets land on you directly over your nose, mouth or eyes. However, this virus can survive for 3 hours in airborne droplets after a sneeze or cough.

As explained earlier, it's also possible that you acquire SARS-CoV2 if you touch your mouth, nose, or eyes after touching a surface or object that has the virus already on it.

Now, understanding when and in what types of settings SARS-CoV-2 spreads is critical to develop knowledge for effective infection prevention and control measures to break chains of transmission.

Human coronaviruses may survive on surfaces ranging from 2 hours to 9 days. However, the duration of survival depends on the type of surface, temperature and relative humidity along with the specific strain of the virus.

As known till date, the maximum survival time of the SARS-CoV-2 on different surfaces is:

Survival time	
3 – 7 days •	
Metals except brass (locks & keys, doors, doorknobs, door handles, car handles, airport chairs, wheel chairs, patient trolleys, pots, refrigerators etc.)	
4 hours •	
Brass items (brass pots, coins, jewelry etc.)	
2 days •	
Wooden (Doors, chairs, wardrobe, dressing table etc.)	
4 days •	
Glass (glasses, bottles, table tops, flower pots, mirrors, glass balls etc.)	
3 - 7 days •	
Plastics (bottles, credit cards, public transport handles, toys, remotes, phones etc.)	
5 days •	
Ceramics (mugs, cups, dishes, pottery etc.)	

4 days	•	
	Papers (newspapers, single papers etc.)	
24 hrs.	•	
	Cardboard, cartons, envelopes etc.	
7 days	•	
	Clothe (handkerchief, towels, face masks etc.)	
5 -6 days	•	
	Leather shoes, sole of leather, rubber or PVC	
8 hours	•	
	Aluminum (tin foil, cold drink cans etc.)	

So, chances of entry to nose, mouth or eyes through transfer of virus from these surfaces, by touch of fingers, is actually for more durations than one can think. So a mistake can be risky.

Surfaces in and around your place of stay or work, therefore, needs frequent sanitization with 1% sodium hypochlorite along with sanitization of your own hand and fingers with alcohol based hand sanitizers or better washing hands with soap and water.

And to be cautious of possible infected surfaces always while going through different areas out of your home is equally important. Touch your mouth, eyes or nose only after your own hands are clean.

However as per recent observations and study reports, this way of viral spread from surfaces is found to be rare.

Insight of an expert
Penned down based on e-mail interview



Sh. Rahul Singh, IAS
DM (South-West Dist.)
Kapashera, Delhi



Important administrative steps taken to overcome the Corona-crisis

1. Made 1st institutional quarantine center in Delhi at PTS Sector 9, Dwarka in March to ensure quarantine of passengers coming from Spain. And thereafter managed surveillance of each and every home quarantine individuals.
2. First to implement concept of paid quarantine in 4/5 star hotels, stay rates fixed by govt., near airport for those, coming from abroad and ready to afford to avail high brand hospitality during 14 days quarantine stay.
3. Made more than 100 containment zones in distt to ensure that spread remains contained.
4. Effective containment strategy. Details on website.
5. Heightened surveillance through more than 1000 field corona warriors.
6. Aggressive testing at each of the 40 dispensary in district. More than 2500 tests every day.
7. Methodical isolation strategy- all those positive cases staying in dense colonies and JJ clusters transferred to CCC (Covid care Centres)/ institutional care centres and not for home isolation.
8. Effective redressal of each and every grievance through covid

helpline of the district.

9. All collective efforts have helped us in keeping the infection lowest.
10. Now, more testing in areas with isolated cases, SSG and HRG; surveillance by involving more than 1500 teachers after proper training for field surveillance. (SSG-Special Surveillance Group; HRG-High Risk Group).
11. Done more than 50000 tests in distt. in last one month, which ensured isolation and hence spread was contained.

For further details, visit the document COVID PLAN_DMSW.pdf given in the following web page:

<https://dmsouthwest.delhi.gov.in/event/covid-management-plan-south-west-delhi/>

LOCKDOWN: ITS IMPORTANT



**Person B at
chemist shop**



Person A



Persons C

Let us assume a scenario. Person A has to travel from his place A to have a meeting with Persons C at a hotel C. On the way, he remembers to take a medicine and goes to the chemist shop where there was already a man in helmet. Being in hurry, Person A gets a strip of his medicine at chemist B in presence of Person B there. He pays quickly and rushes to the hotel to have meeting with Persons C.

After 3 – 4 days, the A develops mild fever, cough and cold and gets tested positive for Covid-19, District Surveillance Officer (DSO) of area has duty to trace the persons who came in contacts with A during last 14 days, the period of infectivity of the virus.

Now keeping in view the events of last 14 days, the Person A will explain DSO the incidences including the scenario of a day as in photographs. DSO asks A to give the names and contact numbers of all those persons so that they can be listed and contacted one by one informing them the possibility of droplet spread from A to them during conversations. Person A can easily give numbers of persons he met at his own place A and of the persons C at the hotel. But he does not remember the person B in helmet at chemist shop as he neither saw him nor knows him.

But to stop the spread of the Covid-19 pandemic, it's essential to identify each of the persons who came in contact with A so that they may be quarantined at separate places to contain their movement, to watch for development of flu-like symptoms in them and if so, to be tested and treated till they become symptom free and turn negative for Covid-19 on retesting.

Here person/persons at chemist B, may be named as Persons of category B, is unknown and untraceable. And no. of category B persons may be huge keeping in view the large no. of infected category A persons in a state or a country. So the governments of states or country implements complete LOCKDOWN for at least >14 days, at one go, of the whole state/country to contain the movement of large no. of even unknown category B persons by limiting them to their houses. Rather it stops the movement of all – the category A of infected persons as well as the category B and C of the persons whosoever came in contact of them. And mind it; the above scenario is single one. However in any population, there are huge numbers of persons in each of categories A, B & C.

Hence lockdown really prevents the spread of virus at least for the period the lockdown is implemented, giving states time to identify the persons having symptoms and get them tested by DSO; and keep them isolated. Closure of shops, offices, institutions and markets etc. completely stops the mixing of infected and non-infected persons and hence stops the spread of the virus and the disease Covid-19. ICMR Serosurvey analysis also advocates it.

Only lockdown can guarantee limit of spread to zero. The lockdown period always need extension till the time cases show diminishing

trend, lowering towards nil. Otherwise once unlocked, markets etc. open, people start mixing and infection gets way to spread from person to persons, increasing the numbers again.

UPDATES ON COVID-19

As Covid-19 is just 6 months old disease, the scientific knowledge is limited. Studies are going on and been circulating among Covid care givers and centres. And the knowledge till now gained are being used in isolation wards and covid hospitals. Most of the nations have been passing these to general public for awareness with purpose of early diagnosis, detection and cautiousness among people for early approach to easy treatments.

Awareness only can help this generation to get off the pandemic as the number of cases now outnumbers the available beds and facilities in any country.

However, people may handle the milder cases at home, and primary care centres may handle the moderate cases. Even the schools and hotels have, so, been transformed in to primary and secondary Covid-19 health centres. This gives some breath to the specialized centres to cope with the available facility for severe cases of corona.

Based on the clinical experiences and knowledge till now, updates may be enumerated as:

1. Washing hands with soap and water is the best method to destroy the virus completely. Froth breaks the outer envelope of coronavirus and kills; water removes it out completely. Alcohol based sanitizer is just an alternate.



Source: #IndiaFightsCorona at MyGov Corona Newsdesk, Government of India

2. N95 face mask is the best protector that is easily available; protecting the virus getting in directly.
3. Mostly fever is the first clear symptom followed by sore throat; both present needs to be tested. Once tested covid positive, high temperature more than 101 °F is a signal of higher risk.
4. **Recently three more symptoms have been seen to be due to Covid-19: Diarrhea, nausea and nasal discharge (rhinorrhea).** Person with any of these must be suspected and tested for Covid-19.
5. Once feeling of breathlessness is there, apart from increased

respiratory rate (RR) per minute, pulse oxymeter, a small device to check oxygen saturation % (SpO2) by applying it over a clean finger nail, is more necessary, to know the level of severity of the disease.

- RR 12-18/min., SpO2 > 95% is normal or say mild, may be managed at home.
- RR 19-30/min., SpO2 92 – 95% shows moderate category, may be managed with oxygen at a health center or at home with oxygen cylinder.
- RR > 30/min., SpO2 < 92% shows severe category; must be shifted to a specialized Covid hospital.
- Check SpO2 specially after three minutes walking when under home quarantine.

Timely detection of hypoxia in Covid-19 positive person can prevent death. The first trigger is 'silent hypoxia' or "happy hypoxia". It appears more when fever subsides (between Day 7 to 9). It may occur even in patients who have no comorbid conditions.

Normally, in hypoxia, carbon dioxide levels are raised and the person is irritable and breathless. But, in hypoxia in Covid patients, the carbon dioxide level is normal, lung elasticity is normal but inflammation of very small vessels occurs in lungs; leading to formation of very minute clots inside vessels due to disturbances into its innermost layer. As a result, smaller arteries are partially blocked but partially patent allowing passage of blood. So there is hypoxia (lack of oxygen in blood) though there is no acute problem like breathlessness as there is still partial passage of blood in small vessels of lung. So it is called '**silent or happy hypoxia**'.

It is indicated by the SpO2 level falling more than 4 on talking or walking for 2 – 3 minutes. **This is the first sign of hypoxia.**

Once this trigger is known, it is time to start oxygen therapy even at home before shifting to a hospital. Therefore arranging Pulse Oxymeter and Oxygen Cylinder even in housing societies and residential apartments will be beneficial so that triggers can be identified early. One apartment in residential areas can be identified and prepared.

6. First mild or recovering fever and then again sudden rise in temperature (Biphasic fever) is a danger sign. It can be sign of fatal cytokine storm. Needs urgent shifting to a specialized centre.
7. High grade fever, rising even after 7 days is also a red flag sign.
8. Presence of comorbid conditions like obesity, diabetes, heart disease, chronic kidney, lung or liver diseases, cancers etc. increase the risk and severity of disease. Most of the deaths are seen in this category of patients. Hence, strict measures of prevention are required. The best is – Stay Home, Stay Safe.
9. Patients are reported no longer infectious beyond 10 days of start of symptoms even if RT-PCR test is found positive.
10. Patients are named in discharge list after 10 days of onset of symptoms if found symptom free for last 3 days.
11. Fever in few cases may last beyond 10 days and needs further investigations for possibility of other associated infections.
12. CT Chest is not a necessity for diagnosis in absence of RT-PCR test as thought earlier. It may only be beneficial to point out any complications if not clear from chest X-ray.
13. Prophylaxis with HCQS (Hydroxy chloro quine sulphate) is advisable only for health workers. For general public, better advice is to boost immunity by taking Vitamin C and Zinc tablets.
14. Favipiravir has been declared the first drug for treatment of mild covid-19. Dosage is very high and should never be tried without advice of a physician. Side effects are always a risk and it is not a guaranteed treatment for all covid-19 patients. Injectable Remdesivir is the second drug recommended; for hospitalized

patients.

15. The cause of death in most cases is found to be the hyperactive immunity, not the virus itself. Low dose steroids (like dexamethasone) and anticoagulants, and injection tocilizumab have been found helpful in reducing the fatality due to this.
16. Plasma therapy has been beneficial in early phases of worsening the case.
17. Just supportive treatments and oxygen therapy are found enough in mild and moderate cases.
18. Covid-19 is caused only through droplets of sneeze, cough or sweating or any other body fluid.
19. It cannot spread otherwise from a hospital building or road side of a health care centre or outside house of a declared positive case as droplets do not travel a long distance; it falls down within 30 – 60 cm of its source. Hence social distancing of one meter is safe and of 2 meters is guarantee of safety.
20. Till now, there has been no reporting of Covid-19 being air-borne infection. But possibility prevails now as no. of virus infected persons sneezing/coughing out droplets are in millions now in every country and movements are not restricted everywhere.
21. As explained earlier, spread is even from those infected who do not show any symptoms, called asymptomatic carriers. Such persons are most dangerous ones, spreading viruses silently in the society, meeting people here and there freely, unknowingly. May be such asymptomatic persons are moving ahead of you on road, be seated in bus, car, metro or any other transport by your side or be coming to your office or your home.

As the time is running ahead, studies from different angles on biology, physiology and disease patterns of covid-19 virus is continuously going on in different countries world over. While this book will be in process of publishing, still knowledge will be getting added and updated on and on.

WHAT THE HELL IS— CONTACTS/QUARANTINE/ ISOLATION

Contacts – Persons coming near to a positive case are called contacts. They are very prone to infection as virus may spread through droplets from patient on his sneezing, coughing or just speaking.

Clinically, Contact is a person who remains with a positive person –

1. In a closed space for atleast 15 minutes;
2. Within 1 meter of distance;
3. Without any protective gear (masks etc.).

However, I quote here the news report of national newspaper The Tribune on July 1, 2020 - Since the first reported case of the virus in India on January 30, at least 70 Indian doctors are feared dead on the frontlines of the Covid-19 battlefield where health care workers are at highest risk.

Purpose of highlighting the above quote along with the fact that doctors are using always the N95 face masks while on duty with patients, is that the third point above is not conclusive. Medical staffs are getting infections even with masks.

So even being with mask, within 1 meter of a positive person, is risky; most probably as masks don't give 100% protection. Hence clinicians are keeping one meter of distance unless unavoidable for some processes.

Quarantine

Quarantine means a condition, period, or place of isolation in which a person or group of persons, that have arrived from elsewhere, or have been exposed to an infectious or contagious disease, are placed.

CDC; Centers for Disease Control and Prevention explains:

the practice of a quarantine involves:

... the separation of a person or group of people reasonably believed to have been exposed to a communicable disease but not yet symptomatic, from others who have not been so exposed, to prevent the possible spread of the communicable disease.

Quarantine may be places like a demarcated area of an airport, any specially earmarked school, banquet, hotel or a religious place etc. where such persons can be kept for some duration so that, a person suspected of carrying infection while coming from an infected area or country, does not spread that infection to others.

Such persons, suspected of being carrier, when kept in area quite separate from his residence, are called to be quarantined.

In another word, people are put in quarantine when they are actually not sick, but may have been exposed to a communicable disease. This helps stop the spread of the disease to the people in area of arrival.

Isolation

When any person, with or without symptoms, is confirmed by tests to be positive for a contagious disease (as here corona), is kept in a separate demarcated area, that condition or place is called isolation. And that person is called to be on isolation.

It again stops the spread of infection from the infected person to his/her own family members as well as the others in surroundings to whom he may meet otherwise.

According to the CDC, the practice of isolation involves:

... the separation of a person or group of people known or reasonably believed to be infected with a communicable disease and potentially infectious, from those who are not infected, to prevent spread of the communicable disease.

Isolation for public health purposes may be voluntary or compelled by federal, state, or local public health order.

Again, Isolation centre may be place like a demarcated area near airport, a specific area of a hospital or specially earmarked hotel, banquets or a religious place declared by state or local health authority.

Difference between Quarantine and Isolation

The major difference between the two is – person suspected of being carrier of infection is kept in quarantine. Once a person or group of persons, with or without symptoms, is tested and declared positive, are kept in isolation. Accordingly, the persons are called to be quarantined or isolated, respectively.

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Important points for setting up of Quarantine Centre

1. Facility should preferably be located away from residential areas and crowded places. It should be secured by outside through fence or compound with proper security arrangements.
2. Facility should be easily accessible through road, rail and air transport.
3. It should be linked to nearby tertiary care facility having facility for management of COVID patients along with facility of transport through ambulance.
4. For every person to be quarantined, facility for separate bed and other minimum logistic for daily use (water, mattresses, soap, towel etc.) should be made available.
5. Preferably separate toilet & bathroom for every person should be made available. If not possible, effort should be made to increase the number of toilet and bathroom in the facility.
6. Manpower i.e. Doctors, Nurses, paramedical staff, sweepers etc. for managing quarantine center should be arranged as per guidelines; and all staff to be fully trained in infection prevention and control measures (IPC).
7. Separate Donning and Doffing areas (for wearing and putting off PPE respectively) and Nursing station should be placed at the entry point of the centre for ensuring the IPC measures.
8. Quarantine facility should have facility of proper ventilation, 24x7 electricity and water supply, and ceiling fan/air conditioning (with temp 24 - 30 °C).
9. Daily Support services like packaged food, Laundry services, recreation facilities e.g. television, internet, awareness materials etc., psychological support, biomedical waste collection etc. should be made available.
10. Standard operative procedures for daily clinical examination and referral should be made and followed up.

WHAT THE HOME ISOLATION MEAN – MUST KNOW FOR A PATIENT OF COVID-19 AND THEIR FAMILY MEMBERS

Persons eligible for home isolation

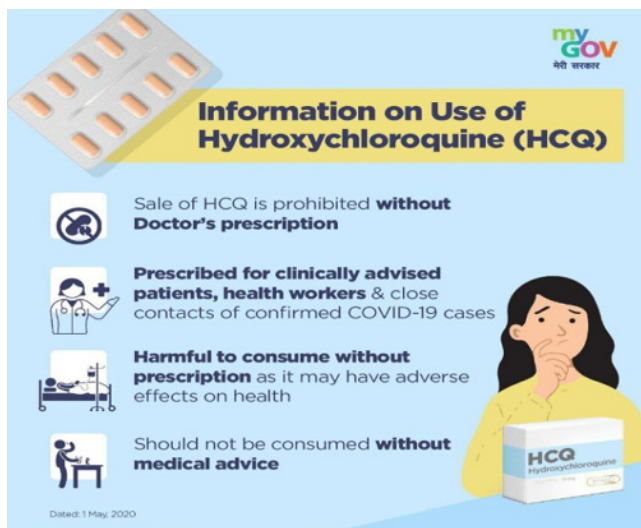
The person should fulfill the following criteria –

1. Tested for Covid-19 and reported to be positive,
2. Should be an asymptomatic or a very mild case on clinical assessment by the treating doctor.
3. Should have the requisite facility at their residence for self-isolation i.e. separate room with attached toilet, provision of food with separate utensils, washing facilities and provision of bed for care giver (if any) at 2 meter distance. Municipal authority takes responsibility for disposal of garbage separately.
4. The patient should agree to monitor his health regularly and inform the health status to the District Surveillance Officer, who will facilitate further requirement of shifting to higher centre if needed.
5. Elderly patients aged >60 years and those with co-morbid conditions such as diabetes, hypertension, heart disease, chronic lung/kidney/liver disease etc. shall be allowed home isolation only after proper evaluation by the treating doctor.

Patients suffering from immune compromised status, e.g. TB, HIV, cancer, cases with organ transplant etc. are not eligible for home isolation. They are treated as severe cases and need to get admitted in a specialized covid hospital.

Family of the person eligible for home isolation must be ready for followings -

1. It is better if a care giver be available to provide care 24 x7.
2. The care giver and all close contacts of such positive cases should take prophylaxis as prescribed by the treating doctor as per protocol of the state e.g. Hydroxychloroquine in India.



Source: MyGov Corona Newsdesk, Government of India

3. A communication link should be there between the caregiver and a specialized covid hospital or the govt. surveillance officer of the area for the entire duration of home isolation.

Directions for the patient on home isolation

1. Patient has to follow respiratory etiquettes all the time. Not to sneeze or cough in open. Use tissue or bended elbow. Tissue to be discarded immediately to a closed bin.
2. Patient to use triple layer (medical) mask at all times. Don't touch the front portion of mask. Discard mask after 8 hours of use or earlier if it becomes wet with sweat, saliva or nasal secretions.
3. Mask to be discarded to bin only after disinfecting it with 1% Sodium hypo-chlorite. Wash hand with soap and water after this. Keep the solution of 1% hypochlorite ready in a spray bottle in room.
4. Patient must stay in a separate identified room and away from

other people in home, especially elderlies and those with co-morbid conditions like diabetes, heart disease, hypertension, renal disease etc.

5. Patient must take full rest.
6. Drink lot of fluids to maintain adequate hydration of body.
7. Hands to be washed frequently with soap and water for at least 20 seconds or clean with alcohol based sanitizer.
8. Never to share personal items with other people.
9. Clean frequently the surfaces like door knobs, handles, tabletops etc. in the room, that are touched often, with 1% Sodium hypochlorite solution.
10. Patient to strictly follow doctor's instructions and medication.
11. Patient to self-monitor his/her health status with daily temperature and SpO2 monitoring (by pulse oxymeter) and report promptly if develops any deterioration sign (fever $>101^{\circ}\text{F}$ or $\text{Spo}_2 < 95\%$).

Instructions for care-givers

1. The caregiver should also wear a triple layer mask properly whenever in the same room with the patient. Front portion of the mask should not be touched or handled during use.
2. Change the mask immediately if it gets wet or dirty with secretions. Discard the mask after use and perform hand wash after disposal of the mask.
3. He/she should avoid touching own face, nose or mouth without washing hand.
4. Hand washing is must after each contact with the patient. Hand wash should also be practiced before preparing food, before eating, after using the toilet, and whenever hands gets dirty.
5. After hand wash with soap and water, use disposable paper towels or dedicated clean cloth towels to dry hands. Replace them when they become wet.

Advice to caregiver for serving the patient

- 1) Always avoid direct contact with body fluids of the patient, specially saliva or secretions from nose.
- 2) Always avoid exposure to potentially infected items around him/her e.g. avoid sharing eating utensils, dishes, drinks, used towels or bed sheets, cigarettes.
- 3) Always use triple layer mask and disposable gloves while handling the patient or his/her items like clothing, linen etc. or cleaning or handling surfaces.
- 4) Provide food to the patient only in the room designated for him. Clean the utensils and dishes used by the patient with detergent and water, wearing gloves.
- 5) Wash hands or use hand sanitizer before putting up and after taking off gloves.
- 6) Wastes like masks, disposable items, tissues, food wrappers etc. should be disposed off to a separate bin – to be collected by municipal staff daily.
- 7) The care giver should ensure the patient follows the prescribed treatment.
- 8) The care giver and all close contacts should self-monitor their health with daily temperature monitoring and report if they develop any symptom of COVID-19 (fever/cough/difficulty in breathing etc.).

When to Seek Medical Attention

Patient /Caregiver to keep monitoring their health.
Immediate medical attention must be sought if serious
signs or symptoms develop. These could include:

-  Difficulty in breathing
-  Dip in oxygen saturation ($SpO_2 < 95\%$)
-  Persistent pain/pressure in the chest
-  Mental confusion or inability to arouse
-  Slurred speech/seizures
-  Weakness or numbness in any limb or face
-  Developing bluish discolorations of lips/face



Source: MyGov Corona Newsdesk, Government of India

When to seek medical attention

Patient or the Care giver will keep monitoring their health. Immediate medical attention must be sought if any serious signs or symptoms develop. These may be:

- 1) Feeling of difficulty in breathing,
- 2) Decline in oxygen saturation: $SpO_2 < 95\%$,
- 3) Continuous pain or pressure in the chest,
- 4) State of mental confusion or inability to arouse,
- 5) Slurred speech,
- 6) Numbness or weakness in any limb or face
- 7) Seizures,
- 8) Bluish discolorations of nail beds, lips, face or tongue.

Role of State Health Authorities

All over the world, state health authorities monitor all such cases through its Surveillance Officers. The health status of the persons under home isolation is monitored by the field health staff under surveillance officer through personal visit. Most of the governments

have also set up dedicated call centres to follow up the patients on daily basis. Following clinical status of each case is recorded daily by the field staff or call center –

- a. body temperature,
- b. breathing rate per minute, and
- c. Oxygen saturation (SpO₂) - measured by applying pulse oxymeter over the cleaned thumb, middle or other finger; its sensor facing the nail bed.

Surveillance Officer studies the records and decides to shift the patient in case of need for further treatment.

All the family members and close contacts also need to be tested for Covid-19 as per the state protocol by the field staff.

Completion of Home Isolation

Earlier patients on isolation were declared fit and advised to discontinue isolation after recovery from symptoms and two negative RT-PCR tests done 24 hours apart.

Recently, after many observations, WHO updated discharge criteria on 27 May, 2020 as following without requiring testing –

- For symptomatic patients: 10 days after symptom onset, plus at least 3 additional days without symptoms (including without fever and without respiratory symptoms),
- For asymptomatic cases: 10 days after positive test for SARS-CoV-2.

For example, if a patient had symptoms for 2 or 3 days, then the patient could be released from isolation after 10 days + 3 days = 13 days from date of symptom onset; for a patient with symptoms for 14 days, the patient can be discharged 14 + 3 = 17 days after date of symptom onset; for a patient with symptoms for 30 days, the patient can be discharged 30 + 3 = 33 days after symptom onset.

*Countries may choose to continue to use testing as part of the release criteria. If so, the initial recommendation of two negative PCR tests at least 24 hours apart can be used.

In India, now there is no need for testing after the home isolation

period is over. However, many states prefer to re-test the patient at 3 days intervals till he/she tests negative.

PERSONAL PROTECTIVE GEARS

(This chapter details all protective gears and what for whom.)

To protect oneself from COVID-19 is only possible if every person always takes a person in front as a possible carrier of coronavirus. In scenario of most countries unlocking the markets and offices, asymptomatic persons are wandering around shops, in markets and offices, and coming positive on testing. So protective gears are must for persons going out of home for work.

Personal protective gears designed to safeguard the health of workers by minimizing the exposure to biological infective agents are called Personal Protective Equipments (PPE).

The personal protective gears are –

1. Coverall/gowns (with or without aprons)
2. Mask,
3. Goggles,
4. Face-shield,
5. Gloves,
6. Head cover and
7. Shoe cover.

Coverall/Gowns - Coverall/gowns are designed to protect body of user from exposure to virus. They provide full 360-degree protection as they cover the whole body, including back and lower legs; coverall protects head and feet as well.

Coverall/gown is most essential for all those works where worker or a professional has to work within one meter of a person likely to be suspected for Covid-19 disease or a confirmed case e.g. doctors and paramedics working in isolation, ICU or emergency area, beauticians in beauty parlours and barbers in hair salons. In these setups, no one knows the clients' covid status while work demands close proximity. Even asymptomatic persons may visit unknowingly.



Medical staff in gown and coverall shifting a patient. In both figures, staff on left is in gown, right one is in coverall

Although the design of the gowns do not provide continuous whole-body protection due to possible openings in back and covering only down to the mid-calf. However by using appropriate protective clothing, at places/hospitals where full coverall is not available, it is possible to create full barrier to stop contact and exposure to droplets, thus protecting healthcare workers required to work within 1 meter of suspected or confirmed COVID-19 cases.

Coveralls and gowns are equally acceptable as there is no such comparative evidence to show one more effective than the other in protecting transmission of infection. Gowns are considerably easier to put on and put off. Many health workers wear an apron over the gown to ensure even better protection for the entire time being in the treatment area.

Coveralls/gowns used in hospitals have stringent standards that extend from preventing exposure to biologically contaminated solid particles, blood and body fluids or secretions of patients, to protecting from possible chemical hazards.

Masks – All the respiratory viruses including Coronaviruses target

mainly the upper and lower respiratory tracts i.e. nose, nasal canal, throat, trachea (wind pipe) and lungs. Mask protects these from the viruses inside droplets/aerosols generated from a suspected or confirmed case of COVID-19; also protects entry of virus by protecting touching nose, mouth or eyes by contaminated hand.

Viewing the importance of masks for awareness of the general public, a detailed full chapter follows separately on mask that will remove the confusions. Here it is dealt in very short.

In addition to less useful cloth masks being used by general public, there are two types of masks recommended for persons working in hospital or community settings, depending upon the work environment:

1. Triple layer (3-Ply) surgical mask (Medical Mask)

2. N-95 Respirator mask

A triple layer medical mask is a disposable fluid-resistant mask, while N-95 Respirator mask is a respiratory protective device with high filtration efficiency, designed to achieve a tight facial fit. Due to much tighter air seal than triple layer medical masks, they give better protection.

Gloves - When a person touches an object/surface contaminated by droplets from COVID-19 infected person, and then touches his own eyes, nose, or mouth, he may get exposed to the virus. Gloves stop transmission through this way while handling objects or surfaces possibly contaminated by suspect/confirmed cases of COVID-19. After use, the gloves should be disposed off to a closed bin.

Nitrile (blue colored) gloves are preferred over latex gloves as they resist chemicals, and usually does not cause allergies. Latex causes a high rate of allergies and contact allergic dermatitis among users. Non-powdered gloves are preferred to powdered gloves as powder also may cause allergy.

COVID-19: Guidelines on rational use of Personal Protective Equipment

Source - Ministry of Health and Family Welfare, Directorate General of Health Services [Emergency Medical Relief]

Patient Care Activities /Area	Risk of Exposure	Triple Layered Mask	N-95 Mask	Gloves	Gown/Coverall	Goggles	Head Cover	Shoe cover
Triage Area in OPD	Moderate risk	X	✓	✓	X	X	X	X
Help desk/ Registration counter	Moderate risk	X	✓	✓	X	X	X	X
Temperature recording station	Moderate risk	X	✓	✓	X	X	X	X
Holding area/ waiting area	Moderate risk	X	✓	✓	X	X	X	X
Doctors chamber in OPD	Moderate risk	X	✓	✓	X	X	X	X
Clinical Management in Isolation rooms	Moderate risk	X	✓	✓	X	X	X	X
ICU facility / Critical Care Ward where aerosol generating procedures are done	High Risk	X	✓	✓	✓	✓	✓	✓
SARI ward - attending to severely ill patients of SARI	High Risk	X	✓	✓	✓	✓	✓	✓
Sample Collection/Sample testing for COVID-19	High Risk	X	✓	✓	✓	✓	✓	✓
Dead Body Packing	High Risk	X	✓	✓	✓	✓	✓	✓
Dead Body Transport	Moderate Risk	X	✓	✓	X	X	X	X
Mortuary - Dead Body Handling	Moderate Risk	X	✓	✓	X	X	X	X
Mortuary- While performing autopsy	High Risk	X	✓	✓	✓	✓	✓	✓
Sanitary staff	Moderate risk	X	✓	✓	X	X	X	X
CSSD/Laundry- Handling linen of COVID-19 patients	Moderate risk	X	✓	✓	X	X	X	X
Visitors attending OPD	Low Risk	✓	X	X	X	X	X	X
Visitors accompanying Patients in IP facility	Low Risk	✓	X	X	X	X	X	X
Supportive services-Administrative Financial Engineering Security, etc	NO risk	X	X	X	X	X	X	X

Use of personal protective gears at different areas of a hospital. Source: Ministry of H&FW, Govt. of India website
<https://www.mohfw.gov.in/pdf/>

Guidelines on rational use of Personal Protective Equipment.pdf

Goggles and Face shield – These give protection to mucous membranes (inner soft layers) of the nose, mouth and eyes from the droplets generated from cough, sneeze or talk of an infected person or during aerosol generating procedures on patients in a hospital setup. Inadvertently touching the eyes/nose/mouth with a contaminated hand is another likely scenario. Hence face shields and goggles are an integral part of precautions.



A medical staff in gown using face shield and triple layer mask for extra protection

The frame of goggles should provide good seal all around eyes, even accommodating the prescribed glasses of the user.



Goggle should accommodate the prescribed glasses of the user

Shoe covers - Shoe covers to be used over shoes must be made up of impermeable fabric to ensure full protection from any contamination.

Coverall used by medical staff working with corona cases has already shoe cover attached in it.

Head covers - Coveralls already cover the head. But those using only gown, should use a head cover that covers the head and neck area while providing care for a suspected or confirmed person with Covid-19. Hair and hair extensions must fit inside the head cover.

MASKS

(The chapter gives you details about mask. However, the recommendations, which one to use, are at the end of chapter.)

Masks are barrier between mouth and nose of wearer and outer environment but may or may not provide full protection from breathing in airborne agents of infection such as bacteria/viruses which are very smaller, in nanometer sizes.

Different types of masks: Common types of masks are–

1. Non-surgical Face/Cloth Mask
2. Triple layer Surgical Mask (Medical Mask)
3. Respirators (FFP, N95 Mask etc.)

Cloth masks (non-surgical masks) - Cloth mask is a woven material, so pore size is bigger than the surgical mask which is made up of non-woven polypropylene material. So cloth mask is less effective than surgical mask in terms of filtration efficiency if droplets are coming from a person in front. Even extra layer in cloth mask is not advisable as each extra layer adds only 2% of extra protection with reduction in comfort.

However, a cloth mask traps droplets that are released when the wearer himself talks, coughs or sneezes. Asking everyone to wear cloth masks can help reduce the spread of the virus from people who have COVID-19 but don't have symptoms. However routine use of even simple cloth mask can decrease the incidence of flu up to 75%.



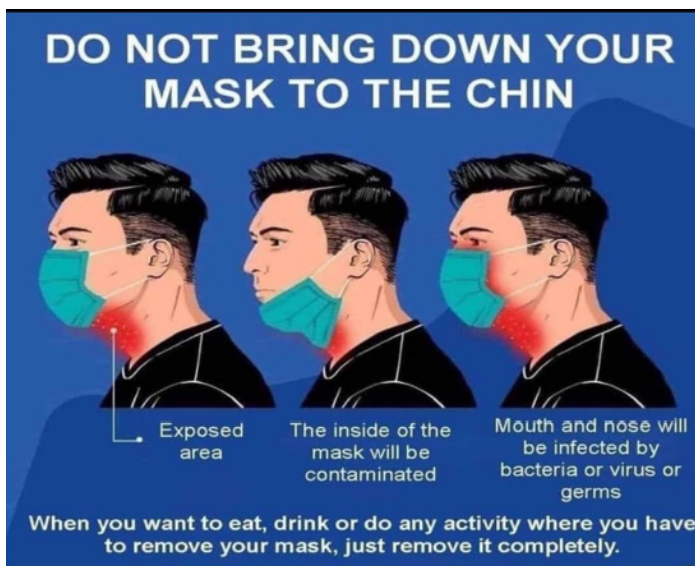
NOW DO YOU GET IT?

Source: Whatsapp platform

Surgical masks are fluid-resistant, disposable, and loose-fitting devices that create a physical barrier between the mouth and nose of the wearer and the environment out of mask. It is used to block only large particle droplets, sprays, splashes etc. It also reduces the exposure of wearer's saliva & respiratory secretions to others.

Triple layer surgical masks have an outer layer, a microfiber middle layer, and a soft, absorbent inner layer; gives equal to or greater than 98% bacterial filtration. With respect to some infections like common flu, they appear to be as effective as respirators; though the latter provide better protection due to their material, shape and tight seal.

They are for use in surgical settings and do not provide full protection from inhalation of airborne pathogens, such as viruses which are too smaller. But they protect atleast from large droplets. However, many countries consider the use of medical masks as an acceptable option in case of shortages of respirators.



Source: Whatsapp Platform

Respirators

Respirators have high fluid resistance, good breathability, tightly fitting on face sealing completely the margins, with clearly identifiable internal and external faces, and duckbill/cup-shaped structured design that does not collapse against the mouth.

Respirators are marked as per country standards –
(Given here with popular numbers)

- N (95/99/100), R and P (United States NIOSH)
- FFP (1/2/3) (Europe EN 149)
- KN95 (China)
- BIS P2 (India)
- Korea 1st class (Korea)
- DS (Japan)

P2 (Australia/New Zealand)

The most stringent standards respirators are NRP and FFP, and gives nearly absolute protection from the respiratory particulates/viruses.

FFP – The Filtering Face Piece mask, also called FFP mask or FFP respirator is a type of protective mask certified by the European Union that serves to protect against particulates such as dust.

The EN 149 standard divides these masks into three classes of filter efficiency, namely FFP1, FFP2 and FFP3. Simply, an FFP3 offers better and greater protection than FFP2 and FFP1. These are just examples of a mechanical filter respirator.

N, R and P are NIOSH (National Institute for Occupational Safety & Health) certified series that apply to negative pressure air-purifying respirators that protect against respiratory particulates. N95 is one among the N- series most preferred by the healthcare workers all over the world.

Understanding the Difference between Masks

	N95 Respirator	
Testing and Approval	by NIOSH (National Institute for Occupational Safety and Health) under the requirements in 42 CFR Part 84	
Intended Use and Protection	Protects the wearer from airborne particles including dust, pollen, mold, and aerosols, but not against liquids, vapors, or gases.	Protects the patient from the wearer's respiratory emissions.
Fit	Highly Sealing	
Fit Testing Requirement	Yes	
Use Requirements	Respirator is donned (put on) and doffed (taken off) properly.	
Filteration	Filter must be at least 95% efficient against airborne particles and is not considered respiratory protection.	Filter must be at least 95% efficient against airborne particles and is not considered respiratory protection.
Sealing	Seal must be properly fitted and designed to prevent leakage of air around edges of the respirator when user inhales.	Seal must be properly fitted and designed to prevent leakage of air around edges of the respirator when user inhales.
Disposal	Respirator is discarded after patient encounter and after aerosol generating procedures. It should also be discarded when it becomes damaged or deformed; no longer forms an effective seal to the face; becomes wet or visibly dirty; breathing becomes difficult; or if it becomes contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.	

Source: <https://www.cdc.gov/niosh/npptl/pdfs/UnderstandDifferenceInfographic-508.pdf>

N, R and P Series Respirators

N, R & P letters denote resistance to oil:

N = Not resistant to oil (to be used in environment having no oil-based particulates)

R = Resistant to oil for 8 hours; and

P = Oil Proof.

Filtration material is an electrostatic non-woven polypropylene fiber.

N-series masks are graded in 3 types based on their filtration efficiency -

1. N- 95 – have 95% filtration efficiency,
2. N- 99 – have 99% efficiency of filtration,
3. N- 100 – are 99.97% efficient.

The minimum of 0.3 micron size particulates and large droplets can't pass through it.

N95 Respirator is the most used mask by the health workers world over. It is designed to achieve a very close facial fit and very efficient filtration of airborne particles or droplets. The edges are designed to form a seal around the nose and mouth.



N95 Respirator: Zoom to see the details of layers

Respirators with valves are not advisable during Covid-19 pandemic as it filters particles/viruses etc. only during inhalation when one way valve gets closed; during exhalation the valve gets opened and allows all droplets, saliva or secretions of the wearer out affecting others in front.

Major difference between mask and respirator is that the mask has loose fitting, it doesn't seal tightly the nose & mouth. So, during breathing, air moves along the edges of the mask, while respirator has tight clip-seal & most of the times air passes only through its material after filtration.

Respirators printed with certification markings of NIOSH (National Institute for Occupational Safety & Health) or NPPTL (National Personal Protective Technology Laboratory) or FFP (Europe EN 149 approval) indicate its high quality standard. NPPTL is a research center within NIOSH located in Pittsburgh, Pennsylvania, specifically devoted to carry out testing procedures and recommend respirators for approval.

When to be discarded –

Cloth masks can be reused after washing; surgical masks should be discarded after single use or after it gets soiled. Respirator mask

should be discarded when resistance of breathing gets increased or gets soiled. Viruses/bacteria can grow & flourish inside the reused masks.

Who to wear which mask:

Recommendations for using masks are -

- Wearing mask, at least cloth mask is compulsory in public places to prevent the fast spread of Covid-19. It's really advisable for all till the pandemic ends. Just a mask with maintaining the social distance & hand hygiene are the sufficient preventive measures.
- Sick person should always wear a surgical mask (triple layer/3-Ply surgical mask).
- Person who is taking care of sick person should also wear the surgical mask.
- N95 mask should be used by all the health workers and other persons who are potential to get exposed with the respiratory droplets of any infected patient.

HOW THE DOCTORS COPE

How the Soul of the doctors feel

Doctors have been the first ones to be in front to fight the disease to save the patients from this killer disease since cases been seen first in Wuhan. World knows that hundreds of doctors have died of Covid-19 along with nearly similar number of other medical personnel getting infected while treating and testing patients in hospital wards, clinics, testing centres and primary or secondary health centres working as care centres for asymptomatic and symptomatic Covid-19 positive cases.

While states and the countries world over got itself locked down, the doctors have been devoting time and body self for the care of humanity, innovating ideas and ammunitions (devices and accessories) and propagating awareness among the general public and to the politicians who otherwise hesitate to take stern decisions to stop the spread of disease at its first entry point. Rare countries like India have shown full political devotion to the issue and made the #IndiaFightsCorona a public movement.

World knew very early in December 2019 the news of spread of a killer virus in Wuhan, doctors there conveying the early messages the virus to be very dangerous, quickly infecting the persons present around infected ones, and warning public to get themselves isolated from infected persons. Even the government there was trying hard to isolate symptomatic suspects. Population world over was getting every bit of news, pictures and videos from affected areas of Wuhan on social media platforms like Whatsapp and Facebook. But no countries responded itself by locking its boundary for aviation till WHO declared it a pandemic, though very late and thought controversial.

Doctors and even intellectual general public had started talking need to suspend airlines aviating across boundaries to stop any possible transmission from Wuhan to other places but policy makers were seen being in confusion and took time to get it locked. Even today, some great political figures, presidents and prime ministers are not ready to make their people aware to stop direct spread by posing self with face

mask.

Then only doctors and health personnel are left bundled with infected or infecting persons – treating them, testing them or advising them how to be safe. One may see even today the videos and writings in circulation on Whatsapp, Facebook and twitter from individual doctors spreading the messages to general public when and how to be alert, and how to get treated or how to get immunity boosted to combat the chances of infection.

These showcase the pain and anguish the doctors are coping with – not only own safety but also the safety of human race for service of which a doctor selects the profession and serves lifelong. They have been working day and night with full energy, warmth and innovations. **Even the family members hesitated in being close to the patient to take care of but doctors had to be in close contact to take the responsibility for his case.**

Requirements of a doctor's setup

Doctors have to protect his face from two possible source of infection. First directly from air droplet from patients and visitors, and secondly from indirect spread from surfaces by touching them.

Measures to prevent self from direct droplet or an air-born infection –

1. Wear mask, goggles and face shield in clinic.
2. Patients to wear mask.
3. Flow of air in room from doctor to patient.
4. Provision of very good ventilation.
5. Limit the face-to-face time with patients.
6. Physical distancing of not less than 1 meter.
7. Sitting arrangement of the doctor and patient - separated by a glass/plastic sheet.
8. Use technology to minimize contacts such as telemedicine, video conferencing, remote monitoring and digital options.

Measures to prevent getting infected through own hands-

1. Never to touch face while working or outside.
2. Wear gloves or wash/sanitize your hand regularly. Soap and water is better.
3. Use of only clinic/ward slippers inside the door.
4. Disinfect the work place twice a day by 1% Sodium hypochlorite.
5. Take special care of your stethoscope, mobile, wallet, keys, eyeglasses, watches, iPods, jewelry, BP instrument, money etc. You may sterilize these by keeping inside the UV Light Sterilizer Box for 6 – 10 min.

Innovations

A famous paediatrician and social activist Dr. Ajay Kr. Singh, practicing in Bhagalpur, Bihar, came with a '**extended stethoscope**' in early days of appearance of Covid-19. He had to examine each child and newborns in his set-up just to save their lives, and that can't be possible with social distance. So he used to get **stethoscope hooked in selfie-stick** in place of cell phone, added 2 meters of tubing and easily managed examining newborns and others maintaining a safe distance. It was later validated even by the cardiologists.



Dr. Ajay Singh with his innovation - Stetho hooked on selfie-stick



Dr. Ajay Singh using selfie-sticked stethoscope to auscultate chest



Hair Band Face Shields: Doctors in Delhi, in early days of arrival of Corona to Delhi, India, devised the ideas of making face shields with the transparent sheets hooking along the thick plastic hair bands. At that time there was not a single face shield in market. Later, market has been flooded with the face shields made in different sizes with comfortable thick band sponges.

Covid Emergency Ventilator: Dr Rhys Thomas, a Welsh doctor, senior consultant at Glangwili Hospital designed a ventilator in Carmarthenshire - in just three days with the help of an engineering company in Ammanford. It was given the go-ahead by the Welsh Government to face the biggest challenge of present generation.



Source: twitter - <https://bit.ly/3btoyUB>

“Phone booth like porta-cabins with glass sheet in front having glove held opening in the centre’ - coronavirus testing facility cabin - for taking nasal and throat swab samples from suspected patients have been of great value in this pandemic.

3M 6000 series Half Mask Respirators have now allowed the surgeons, operating corona positive or suspect patients, way to cope with the risk of covid-19.



3M 6000 series half mask respirator

Similarly innovations like Protective Plastic Capsules, Robots, Hands-Free Door Openers and UV light Sterilization Box to sterilize accessories and belongings have helped the doctors lot to cope with the killer virus.

Coping with Strategies

Since arrival of the Covid-19 cases to the countries, the doctors all over world have been coping with the changing strategies ever day by day on different aspects due to ongoing studies:

1. Covid-19 Response plan,
2. Advisories on the use of HCQS as prophylaxis,
3. Strategies for Covid-19 testing,
4. Managing Covid -19 cases,
5. Managing healthcare workers working in Covid and Non-Covid areas of the hospital
6. Screening criteria for the suspects,
7. Monitoring plans for Covid care health centres,
8. Advisories for treating the patients,
9. Criteria to screen the surveillance area,
10. Strategies for isolation of Covid-19 positives,
11. Discharge policies for Covid-19 cases,
12. Criteria for compulsory Antigen Detection Testing,
13. Standard operating procedures for disposal of dead bodies of

Covid-19 patients/suspects, etc. etc.

Going through all these day by day have led to stress to the doctors in day to day working and managing the hospitals as well as patients.

Coping the Psychological Distress

Doctors and other health workers are at a heightened risk of psychological distress during this pandemic, due to increasing number of COVID-19 cases, the overwhelming workload, fear of infection for themselves and their families, concerns regarding family care and responsibilities. In addition, attention to negative information about the pandemic and getting negative results on critical patients are major factors for psychological stress.

Clear communication, limited shift hours, provision of rest areas, detailed trainings on the use of personal protective equipments and specialized training on handling COVID-19 patients may reduce anxiety and the hazards involved. Healthcare institutions are coping with these by ensuring sufficient support, providing frequent education and training, and ensuring adequate resources.

CORONA WARRIORS are Immortal

According to Indian Medical Association National Registry, till now 1366 Doctors have suffered from Covid19 across India. Out of that 106 doctors have succumbed to death.

Out of these 106 doctors, 60 doctors are General Practitioners & 46 are Specialists.

Out of 106 doctors, 76 doctors are of age of 50 years & above and 30 doctors are below the age of 50 years.

Nearly same number of paramedical staff has lost their life getting infection from patients. Other countries too have reported deaths of doctors and other health workers, infected during care of Covid-19 cases. It's shocking and shows impact on the medical fraternity across the world. Author pays tribute to all the corona warriors losing life in service of humanity.

Insight of an expert
Penned down based on e-mail interview

Dr. S. N. Choudhary MS, DA
District Nodal (Covid-19)
Lohardaga, Jharkhand
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Corona: A Viewpoint from Grass root
District Lohardaga, Jharkhand

With upsurge in the case scenario at Wuhan, the world was totally ignorant about the quantum of the menace of Novel Corona Virus Disease. As it transgressed into the helm of Europe, people started thinking it's propensity to spread the whole world.

The Government started acting with a leisurely attitude, knowing very little about its actual impact on the economy of world. Being a common man from third world countries, we were in a position to formulate little for a mammoth problem of public concerns. To my mind, working in a small district of 5-6 lakh population, the Government started just an ad-hoc preparatory amalgamation of tangible stature, but media and social networking played a major role in emphasising the situation in a manner larger than the frame. Truly dynamic strategy with ever changing guidelines and protocols, lot of government financial management was envisaged on nonessential preparedness. Not a single state of our country ever thought the impact of lockdown on migrant population creating unnecessary havoc and stampede like situation amongst poor populations of India. With further extension of lockdown, tragic slump in livelihood and the economy has come not only in our part but all across the world.

With invent of RT-PCR, TRUENAT and RAPID ANTIGEN TEST, the protocol of testing kept on changing miserably along with change in the quarantine and home isolation policy.

We see the impact of crisis in terms of the non-availability of required beds, isolation wards, manpower, infrastructure and supply from market. Unprecedented lockdown has impacted availability of essential logistics and delivery of items.

Inspite of district not having a basic infrastructure, were suddenly upgraded to a high end specialist centre with multipara, ECG monitor, auto-analyser, oxygen pipelines with manifold, oxygen concentrators, syringe pumps and infusion pumps, ventilators, defibrillator and so many complicated instruments. Though it was a positive, we missed the utmost crisis of health personnel to run these gadgets. With increasing numbers of testing, the incidence of new cases started swelling enormously while number of health professionals remains the same. Situation has lead to a state of non-coherence between man, machine and mind. No one cares why the medical profession suffers wrath of the Covid-19 worse than any other profession of the society. Chaos has kept on increasing and now we are at the watershed where the disease seems to escape the controlling strategy and sooner or later it will become a community based menace.

Strategy now - There is no time of contact tracing, so in order to contain the disease we have to improve our testing tools, cover more and more people in our testing areas, and acquire a policy of home isolation so as to conserve our resources in terms of logistics and financial resources which are not utilized properly. Lot of money is involved in transportation, isolation, food and livelihoods which are blindfolded as no one is able to monitor it. Those being kept in home isolation cared by own family members certainly get better diet and empathy to become disease free earlier especially in mild and moderate cases.

Though it sounds unlikely but if we don't have a proper medical facility, we shouldn't either give a false feeling of doing something in system rather than to keep them at home.

Insight of an expert
Penned down based on e-mail interview

Dr. Om P. Chaurasia,
MD, MRCP, FACG, FASGE, AGAF
President & Medical Director,
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Performing Gastrointestinal Endoscopic Procedures at Ambulatory Endoscopy Center (AEC) in the era of COVID-19:

1. Safety of patients as well as healthcare personnel is of paramount importance.
2. Triaging of patients to appropriate facility setting should be based on the indications for Gastrointestinal (GI) procedures.
 - a) Emergency indications like gastrointestinal bleeding, food impaction, acute cholangitis are managed as inpatient.
 - b) Only elective and semi-urgent procedures are performed at AEC.
3. Endoscopy centers can resume elective procedures once the new COVID-19 positive rate plateaus for at least 14 days, and central/federal, state and/or local authorities allow healthcare facilities to reopen.
4. Mitigating the risks of COVID-19 for patients as well as healthcare providers:
 - a) Patients: Pre-procedure COVID-19 testing is done by nasal or throat swab (if available). Universal COVID-19 screening of all patients is done using a set of questionnaire a couple of days

before and on the day of the procedure. All patients must have face covering/mask prior to entering a Center.

- b) Healthcare Providers: All staff get daily temperature check and COVID-19 screening questionnaire. In addition to standard universal precautions, appropriate PPE (Personal Protective Equipment) including mask (preferably N95), face shield, head cap/bouffant, gown, gloves, shoe covers should be used. Donning and doffing of PPEs should follow proper protocols.
 - c) Facility: Gastrointestinal Procedure room's air-conditioning system should have appropriate air exchanges per hour and preferably have a negative pressure environment. Frequent sanitizing of high-touch areas with wipes or sprays containing chemicals effective against COVID-19.
 - d) Procedures: Certain procedures like Upper Gastrointestinal Endoscopies have higher risk of aerosolization. In such cases, POM (Procedure Oxygen Mask) is preferable for patients. Provider's masks must be N95 at the minimum.
 - e) Discharge and admission: Patient's ride/family members are not allowed inside the facility. Therefore, patient intake and discharge policy should be appropriately changed.
 - f) Follow up of patients: In addition to routine follow up, call to patient that used to be made even before COVID-19 era; a 2-week follow up call should be made to inquire about any interval COVID-19 symptoms and/or test positivity.
5. Post-COVID-19 Exposure Policy: A clearly delineated policy must be in place to handle the situation where either patient or staff is exposed. This includes, but not limited to, COVID-19 testing, contact tracing and quarantine.

WHAT FOR SAFETY AT HOME

What You Can Do

1. To reduce the chances of getting or spreading the coronavirus SARS-CoV-2, clean and disinfect the common surfaces and objects kept in everywhere in your home and office every day. This may include –

- Tables, chairs, dices and stools,
- Countertops
- Doors and doorknobs,
- Refrigerators and other appliances,
- Cell Phones and landlines,
- Flower pots and vases,
- Remotes and keyboards,
- Switches and adapters,
- Baskets and toys,
- Bathroom fixtures,

•
Toilet and toiletries etc.

Most of the disinfectants used for cleaning of floors daily have ingredients usually 0.5% to 1% of sodium hypochlorite. This may be prepared from easily available bleaching powder. However, sodium hypochlorite is also available in departmental stores in 5% solution.

In these days of Covid-19 pandemic, it is better to use 1% sodium hypochlorite to disinfect everything. To convert 5% hypochlorite into 1%, just dilute it 5 times. e.g. dilute its one litre with normal tap water to make it 5 litres (adding 4 litres of water). If you need only one litre of 1% sodium hypochlorite, take its 1/5th quantity i.e. 200 ml (small mug amount) and dilute it with tap water to make it 1 litre (water bottle volume). Fill it in a spray bottle ready to sanitize and wipe with clean cloth all the doors, doorknobs, tables, chairs, countertops, switches, cell phones, baskets etc. etc. This 1% hypochlorite solution in a bucket may be used to clean everything including wiping the floor. If the surfaces are much dirty, clean them first with soap and water and then disinfect them.

However toilet seats require strong acids 10% hydrochloric acid like Harpic liquids or 1-3% ethanol like Lysol to clean it.

Surfaces should be kept clean even if all members in house are healthy. People who are infected may not have symptoms, but they can still shed the virus infecting surfaces.

2. While handling any ill person's items including linen, put on disposable gloves preferably nitrile gloves. Dispose gloves in bin after work is over, and wash hands with soap and water.
3. Every member should remember to wash their hands with soap and water for at least 20 seconds on returning after visit to grocery store or market etc.
4. Fruits and vegetables should be rinsed and washed under running water after bringing it home and before you eat them. Scrub them with a brush or hands to remove possible germs on their surface.

These help remove 90-99 per cent of any contamination. Remember to wash hands with soap and water after handling.

5. Canned or frozen products may be bought to avoid infections unknowingly if some members have low immunity or comorbid conditions like diabetes, kidney or heart diseases as there has been no evidence anyone getting the virus from food packaging. However containers or packed grocery items may be wiped and left to dry.
6. Reusable grocery bags like cloth bags should be washed or disinfected after each use; and dry them.
7. The shoes or slippers used outside home to visit office or market should be left out of door on return. Otherwise soles will need to be sanitized.
8. In case of something bought online and getting delivered, let delivery boy drop it at distance. First sanitize the package by spray sanitizer before touching and taking in. Same process should be done for packages shipped in or posted.

However virus usually doesn't survive for the time post or package takes time to be delivered. Contact with delivery boy must be avoided. Remember to wash hands with soap and water after handling the package or the mail.

Coming Home Checklist

You should minimize going out except for essential things. These are the important steps to follow when you come back home, to protect your family and reduce the chances of you bringing the virus home.

Wipe your mobile, keys, and anything else you took outside with you, along with all the items you purchased from outside with a cloth dipped in water and soap or disinfectant.



Change your clothes. If possible, take a bath.



Take off your footwear and leave them outside.



Wash your hands with soap and water for 20 seconds



- Remove your mask from behind the ear without touching the front
- Wash store bought vegetables and fruits with water. Again wash hands.
- When you are able to, wash your clothes and mask with soap and water, and dry in the sun.

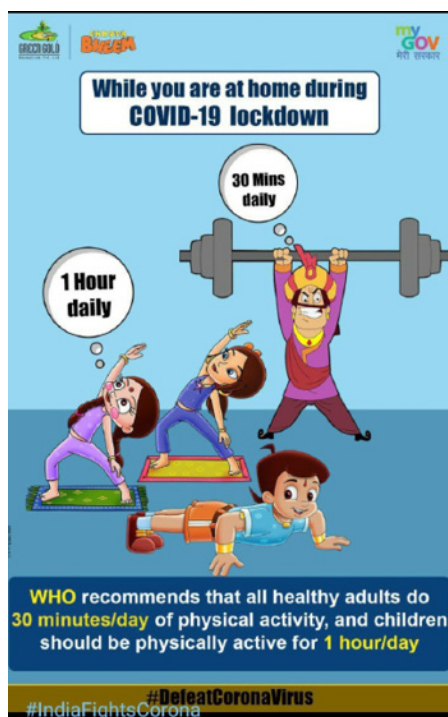
The items you bought from the store might have coronavirus on them. Leave what items you can near the door to your home for a few hours.



Washing hands and sanitizing surfaces frequently is the key here. So, always make sure that you clean your hands before handling, preparing or eating a meal.

However till the pandemic lasts, one should limit trips to the grocery stores/markets etc. as there is always risk to get in contact with the people with novel coronavirus, with or without symptoms.

Apart from these, to keep mental health status positive, all the members of the family have to keep themselves engaged in some activities at home like daily exercises, reading books, updating knowledge on internet, practicing hobbies etc. if not going out to their job. The parents have to take care of children and keep them busy in activities and games.



Source: #IndiaFightsCorona at MyGov Corona Newsdesk, Government of India

As schools are to open only after pandemic runs out towards its end, knowledge enhancement of the small children and adolescents may be kept going through books and online study materials available on net in plenty. Even governments have taken initiatives and made available

course curriculum for children and necessary programs and works related to government offices online to avoid gatherings and risk of spread of Covid-19.



Source: MyGov Corona Newsdesk, Government of India

Similarly elders are at higher risk and needs special care and motivation to keep them healthy, engaged and happy by ways of call or video conferencing with family members, timely medicines and in-house exercises and meditations.

Insight of an expert
Penned down based on e-mail interview

President-Amit Sardana

Secretary-Sumesh

Gautam

Treasurer-Pratima

Chaurasia

Members- Rama Tiwari

D S Bist

D P S Rawat

Neena Sudan



Management Committee

SHAKUNTALAM APARTMENTS

**PRECAUTIONS TAKEN UP BY SHAKUNTALAM CGHS LTD.
DURING THE PERIOD OF PENDIMIC COVID-19:**

1. The society created a group on Whatsapp to involve all the members regarding information/awareness of covid-19.
2. All the seven members of the Management Committee were well connected/informed with one another as well as with other members/residents of the society.
3. The instructions issued by the government of India/other concerned agencies were strictly followed.
4. preventive measures were taken up at the entry point of the society, which are detailed as under:-
 - a. Hand washing compulsory.
 - b. Alternatively hand sanitization compulsory.
 - c. Facility of Oxymeter made available for checking oxygen level.
 - d. Facility of checking of temperature at the gate itself; must for non-members.
5. Entry of non-members/guests 100% restricted.

6. Movement of residents inside the boundary of society also restricted.
7. Children not allowed to move in and around the society.
8. Entry of domestic helps completely stopped except where non-avoidable situation.
9. The visits of safai karamchari also restricted to the ground floor only; not allowed to use the lifts.
10. Regular sanitization of the entire society carried out at regular intervals; supervised by the Management Committee.

For & on Behalf of Management Committee

(President)

Sh. Sumesh Gautam.



What for safety during travel

(Chapter Contributed by a renowned doctor and author of medical books who traveled recently from Delhi, India to Texas, USA.)

Dr. Rituraj Upadhyay

MBBS (AIIMS), MD (AIIMS)

Fellow,

Department of Radiation Oncology,

MD Anderson Cancer Center,

Houston, Texas



5 Important **items** must have during travel

1. Personal protective Equipment - includes a face mask, gloves, face shield etc. Any type of mask is fine. It should be comfortable. Avoid N95 / bigger masks, especially if you are taking a long flight/ road travel. You may tend to remove N95 masks intermittently/while sleeping, which is not a good idea.
2. Sanitizer sprays - Keep plenty of small bottles. Sprays are better than liquid preparations as you can easily sanitize the area where you are planning to sit/ place your hands.
- 3 Food – Local/Airline food may not be fresh, so it is a good idea to keep your own food. Keep dry food items which don't take space and more importantly don't smell. Make sure not to carry pickles; sniffer dogs will catch them, leading to your baggage being searched.
4. Warm Clothes - Temperature fluctuations are bound to happen especially in long flights. Try to dress in layers, keep a small portable blanket (you won't be provided one in flights/rails/bus/metro).
5. Common Sense and patience - Most important things to keep in mind. Everyone is in the same boat, worried about Covid, don't

try to rush. If flight, let the airline/airport staffs do things at their own pace; they are trying to ensure everyone's safety.

5 most important things to remember while travelling domestic or abroad during Covid-19

1. Try to maintain social distancing as far as possible - Especially while standing in queues and elevators. Don't stand close to other people, it might make them uncomfortable.
2. Hand washing - sanitize or wash your hands frequently, especially after you touch door handles, arm rests, use restroom etc.
3. Keep yourself hydrated - Drink plenty of fluids. This is the best way to keep our body fit and running.
4. Do not panic – flights/metro/buses are usually completely occupied, and it is almost impossible to maintain social distancing. You should do your part, avoid crowding around aisles. Board and de-board in sequence, giving people in front of you and behind enough space.
5. Do not travel until it is necessary/urgent - Avoid leisurely trips at all costs and stay at home as far as possible. Plan your trip only if you have unavoidable reasons to do so.

What for safety at workplace

(Offices, Shops, Malls, Restaurants, Industries etc.)

**Written with contributions from Dr. Jyoti Kumar, DGM (CC),
GAIL (India) Limited and Mr. Saurav Nath, Awarded Chef,
London.**

The Covid-19 pandemic has brought about an unprecedented situation. Several key aspects of our daily lives including work, family outings, gatherings and social interactions have remained severely restricted. Worst hit have been the workplaces (offices, shops, markets, industrial establishments etc.).

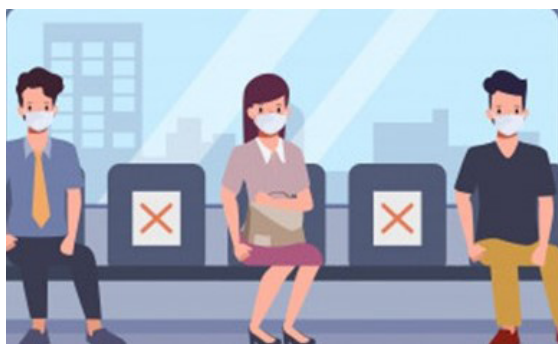
However, we must remember that tough times don't last long but tough teams do!

Your office team must stand with each member of your workforce at every step as a united team –**'with you at every step'**.

Common directives for workplace should be –

1. Work from Home as far as possible,
2. Staggering/redistribution of duty hours among staff of the workplace,
3. Employees at higher risk i.e. older ones or with comorbidities, pregnant ladies to take extra precaution. To give work from home if feasible,
4. Thermal scanning of all along with use of sanitizer at entry and exit points,
5. Only asymptomatic staff/visitors to be allowed,
6. **All staff, officers and any visitors to be allowed entry only if using mask, and to be worn at all times inside the workplace,**
7. Provision of Hands-Free Door Openers,

8. Drivers also to maintain social distancing and follow required Do's and Don'ts,
9. Routine entry to visitors to be restricted,
10. Meetings to be done only through video conferencing as far as feasible,
11. Poster/AV media on Covid-19 preventive measures to be displayed at prominent places of the premise,
12. Availability of hand wash or alcohol based sanitizer at all entry points, workstations, work desks, common areas and exit points,
13. Ensure all PPE is stored in a protected location. PPE to be disposed off carefully in lidded bins.
14. Frequent sanitization, with 1% sodium hypochlorite, of the entire workplace, common facility areas, lifts, staircases, and frequently touched surfaces like doors, doorknobs, handles, armrests, escalator buttons, railings, switches etc. etc.,



Social distancing in waiting area

15. Adequate distance between workers $>1\text{m}$ (meter) if no separate workers' cubicles.
16. Adequate gaps between customers standing in queues (mark circles for them at $>1\text{m}$),
17. Avoiding unnecessary movements to colleague seats/area,
18. Avoid gossiping/ talking within 1 meter distance,
19. Staggering of lunch time among staff,

20. Never be without mask if other worker visits you (for giving files or anything else or for nothing),
21. Say no to visitors as far as possible,
22. In common sitting areas for visitors, cross the alternate chairs to avoid sitting within 1m distance,
23. Contactless/digital mode of ordering/payments whichever be relevant at your workplace,
24. Sanitization of parking area,
25. Sanitization facility for inside of vehicle specially steering wheel, keys, hand break, handles and doors if there is valet parking,
26. Provision of an isolation room/area designated for any worker/ staff found ill,
27. Liaison with the nearest medical facility, or availability of contact no. of district or state helpline with facility to call for further action.
28. Availability of list of location and contact numbers of nearest testing centres.

Directives to all individuals must be –

1. All staff/workers to wear mask and hand gloves at all times, and wash or sanitize hands after putting off gloves at the end of work hour.
2. After touching file, papers, plates/other utensils, remember to wash/sanitize your hands, especially before touching your own eyes, nose, mouth or belongings.
3. Tables to be sanitized each time a customer, resting arms at your table, leaves.
4. Every staff to follow social distancing norms everywhere including kitchen area, if any.
5. To greet people without physical touch.
6. To maintain respiratory etiquettes – cover nose & mouth with tissue

or bended elbow while coughing or sneezing,



Source: MyGov Corona Newsdesk, Govt. of India

7. Avoid taking public transport to attend duty to limit risk of exposure and physical contacts.

Measures to be taken if someone found ill –

1. Keep the ill person found with symptoms suggestive of Covid-19 in an isolated area/room till seen by a doctor, advised and sent to home (isolation) or hospital as per evaluation.
2. Sanitization of the areas visited by the ill person in last 48 hrs. to be taken up if ill person found suspected/positive for covid. Other areas may function normally.
3. District authority to be informed about ill person if suspected to be Covid-19 case. District team will undertake listing of contacts and contacts tracing in and out of office premises.
4. High risk contact persons of positive tested staff (to be assessed by District authority team) to be quarantined for 14 days,
5. Low risk contacts to continue work with close monitoring of their health for next 14 days.

6. In case of larger outbreak (large no. of workers found suspected of Covid-19), the building to be closed for 48 hrs. after thorough disinfection. Work to be done from home by all staff for that period. Detailed guidelines on disinfection procedures for offices/buildings are available on health ministry websites of the governments.

Additional Precautions/advice For Restaurants

1. Disposable menus are advised to be used apart from contactless mode of ordering and digital mode of payment (using e-wallets).
2. Instead of cloth napkins, use of good quality disposable paper napkins to be encouraged.
3. Staff to restrict self to the working section only (e.g. butcher/fish/veggie).
4. Adequate mouth-to-mouth distance ($>1\text{m}$) among customers at same table, and $>3\text{m}$ gap table-to-table.
5. All precautions to be ensured for handling supplies, inventories and goods.
6. Preferably separate entry and exits for patrons, staff and goods/supplies to be ensured.
7. Tables to be sanitized each time customer leaves.
8. Bikes and bags sanitization before and after every delivery, in case of home delivery services.

Insight of an expert
Penned down based on e-mail interview

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New Delhi - 110066



How the Corporates Fight the Pandemic
GAIL (INDIA) LIMITED

GAIL (India) Limited is India's leading natural gas company; owns and operates a network of around 12,200 km. of pipelines; extending soon to over 18,000 km. by 2021. GAIL has one of the largest portfolios in world in Liquefied Natural Gas market; pioneer in city gas distribution in India; expanding its presence in renewable energy with portfolio of 117.95 MW of wind and 10.76 MW of solar energy. GAIL holds 75% market share in gas transmission with Gas trading share of over 50% in India.

GAIL: Fighting the Covid-19 Pandemic

1. Monetary Contribution to PM CARES Fund -

GAIL and its employees contributed Rs 53.8 crores to PM CARES Fund.

2. Social support of over Rs. 3.5 crores to various district administrations across the country for PPE, ventilators, masks and other equipment; added by food packets and ration kits distribution to needy sections of the society.

3. Medical Advisories and Support –

- Advisories issued by Corporate Medical Section.
- Quarantine facility developed at Noida, Pata (UP) and Vijaipur (MP).

- Tele/video consultation facility for all medical needs including cases of mental stress.
- Standard Operating Procedure (SOP) for running the offices in pandemic period.

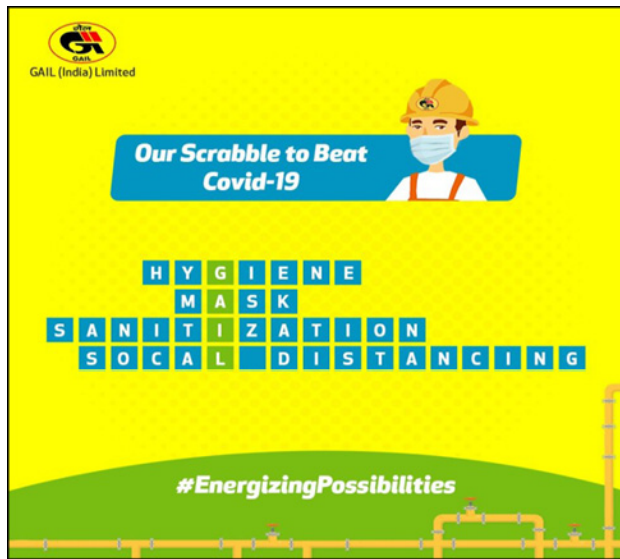
4. Mega sanitization works in all GAIL offices –

- Regular sanitization of offices, parking area and vehicles
- Hand sanitizer dispensers at all appropriate points

5. Innovation and Technological breakthrough - GAIL funded Start-Up M/s. PerSapien Innovations designed and developed N99 masks - with better breathable technology; reusable up to 20 washes; already introduced in the market.



6. High Level committee and Task Force constituted to coordinate and monitor all efforts vis-à-vis COVID-19 pandemic within the organization.
7. SPARSH Initiative led by Director (HR) with messages and calls to boost morale of all employees across India and USA/ Singapore.
8. Awareness Campaigns – GAIL with 3,70,000 followers on Facebook, 80,000 on LinkedIn and 66,000 on Twitter had awareness campaigns about COVID-19, Govt. initiatives and



9. Initiatives to keep employees and family members engaged during lockdown period -

- A song titled 'Ek Doosre Ke Liye Hai Khade Aap Hum, Ek Doosre Ke Liye Savdhan Hum' recorded by employees put on GAIL social media channels - to highlight the importance of social distancing.
- Another song, 'Ruk Jaana Nahin', sung by the employees, showcased the spirit of the 'GAIL Warriors' executing projects during pandemic
- A motivational video 'Badhte Rehna Hi Nayako Ka Swabhav Hai' to salute the frontline warriors like doctors, nurses, police, sanitation workers, etc'.
- 'Lockdown Chronicles' - An initiative of collection of stories, poem, photographs, paintings etc. from the employees on experiences of the lockdown.
- ebooks launched comprising entries from budding authors of GAIL with 400 entries.
- Slogan Competition in hindi and english with >800 entries from 228 employees.

**Lockdown may be over, but the battle
against Covid-19 is not**



Ensuring health and safety of all at our work places.

10. Other Significant Measures by the GAIL - GAIL Training Institute launched/conducted -
- Micro learning program and Massive Open Online Course (MOOC),
 - SOP for dealing with any suspected or positive COVID-19 case prepared and circulated to all work centres.
 - Necessary instructions to reduce the meetings / gatherings,
 - Meeting only through Video Conferencing.
-

HOW TO OVERCOME THE CRISIS

PREVENTION: IMMUNITY/VACCINATION

World still battling the killer

The world is still battling to overcome the common enemy – Coronavirus, and is taking plenty of measures to contain and kill it by working from different angles. Social distancing, wearing masks, healthy etiquettes while coughing or sneezing, and washing/sanitizing hands and surroundings, are the one angle to fight the spread.

The only other angles to kill enemy are to have a good self-immunity and a successful vaccine.

Immunity

Immune system is a defense system of complex network of white blood cells and proteins (present in plasma of blood) and some organs that defend the body against any foreign body/infection (antigen) by producing plenty of antibodies to kill it.

The immunity may be – active or passive depending on how it has been made – actively by a person's own system or has been “borrowed” from another source.

Our body develops immunity (antibodies) to a specific disease in two ways – either naturally or by vaccination. For some disease like chickenpox, mumps or measles, having the disease usually leads to lifelong immunity to it. Vaccination is the other way to develop immunity in which a small amount of a specially treated virus, bacteria or toxin is injected into the body. It produces the disease but very mild, without any risk to life. The body then itself develops antibodies to it.

Both ways of getting immunity, either naturally from being infected ever or from vaccination, are examples of active immunity. **Active immunity** results when a person's own immune system works actively to produce antibodies. Antibody recognizes the specific antigen (virus,

bacteria or toxin) against which it was produced by the body. If the body encounters that pathogen (e.g. virus causing mumps) again in future, long-lasting antibodies already present in body specific to it will already kill all those pathogens.

Passive immunity is “borrowed” from another source and lasts for a short time. For example, borrowing ‘convalescent plasma’ (having antibodies to coronavirus) from a convalescent (recovered) Corona patient used in the plasma therapy protects the life of a recipient Covid-19 patient by killing the coronavirus.

Prevention

Novel Coronavirus – 2019-nCov or SARS-CoV-2 being new virus for human body, nobody has immunity against it. So, till a vaccine comes to market, the only guard to protect a person is to keep our immune system healthy. This can be done by –

1. Avoiding junk foods.
2. Eating plenty of fresh fruits, vegetables and whole grains. Ensure homemade healthy diets.
3. Avoid stress and sleep well.
4. Regular in-house exercise.
5. Having tablets of Vitamin C and Zinc once daily for 2 – 3 weeks.

Vaccine

Daily life cannot return to normal until the populations have built up enough antibodies by virtue of herd immunity (community immunity) to fend off the virus. And herd immunity can’t be waited to happen through spread of infection among large populations. Developing a successful vaccine is the only answer to save the humanity from getting lost to the killer pandemic.

Even as countries toy with the idea of relaxing lockdown and restarting life in the COVID era, the novel coronavirus continues to claim more lives. As of now, COVID-19 has infected more than 17.8 million people across the world and caused 684,468 fatalities.

There are about 150 vaccine candidates worldwide, >70 of these are being tracked by the WHO. As per recent reports, 12 top vaccine

candidates were in second phase of human trials while 3 vaccines have entered into third and final phase – Oxford's AZD1222 vaccine, Moderna Inc. Covid-19 vaccine from USA and CoronaVac from China.



Vaccine being developed by Indian scientists

Indian scientists are leaving no step behind to present COVAXIN, a homegrown novel COVID-19 vaccine to battle the surge. COVAXIN is amongst the strongest competitors being developed by Bharat Biotech International Limited (BBIL) in collaboration with ICMR (Indian Council of Medical Research) and NIV (National Institute of Virology), Pune. It is expected to complete the trials and made available for use by the end of this year.

Till then, it's only the preventive measures and maintaining good immunity by which one can have safety from getting infected.

Insight of an expert

Penned down based on e-mail interview

Dr. Ajay Kumar Singh
MBBS, MD
Paediatrician &
Neonatologist,
And Social Worker,
Bhagalpur, Bihar.



Important steps/points to prevent spread of Covid-19 at hospitals/clinics

My hospital has Paed. OPD, Paed. General ward, 30 bedded NICU, and Vaccination facility.

My steps to prevent hospital staff and hospital for community spread are as follows:

- 1) Patients are advised to take prior appointment telephonically so that limited people gather at a said time which will facilitate social distancing among patients.
- 2) Big zero shaped circles made at all points like Registration, Cash Counter, medical store for good social distancing.
- 3) We have marked cross marks at alternate seats of long chairs at waiting hall; means not to sit at crossed seats.
- 4) Alcohol based sanitizer at entry points.
- 5) Temperature testing of all staff by infrared thermometer.
- 6) Medicines will be given to NICU patients only by medical staff, not by attendant.



Demonstration of CPR by the Jeevan Jagriti Society, led by Dr. Ajay Kr. Singh (Pre-corona social activity)

- 7) All staff to wear gloves, masks and head shield.
- 8) Daily at least 2 times sensitization.
- 9) To put IV Cannula & Ryle's tube in paed. patients, staff have to come very close. For this I have made a separate chamber covered by plastic curtain, which will certainly prevent covid transmission. that is sanitized regularly.

Other points we look for -

- 1) Staff will come by own vehicle, hospital vehicle or on foot, but certainly not by auto or other public transport.
- 2) If they are residing in hostel or shattering, they should cheque their partners' temperature also.
- 3) If they are coming from home, staff must keep distance from other family members as far as possible.

Tips for your protection from Covid-19

Transmission of coronavirus is now only from human to human; so only human can protect human. It's very clear and that is the only truth. **So please follow the tips and be a saviour.**

1. Washing hands frequently with soap and water is your first saviour. This will keep you protected from virus while touching your nose, mouth or eyes with probable virus in your hand (coming due to touching any infected surface)
2. And the second saviour of safety is the social distancing of 2 meters all around always whether moving, seating, standing or chatting. **Never go to a crowd.** There is high risk of taking or giving infection and its spread.
3. The use of a triple layer or N95 face mask is the third saviour for you to save from getting coronavirus in. Must use mask once you are out of home and put off only when back home. Otherwise you may get infected and risk spread to your family members.
4. **Avoid shaking hands. Greet your friends with folded hands in Indian style. Or just say hello.**



Source: #DefeatCoronaVirus at MyGov Corona Newsdesk, Government of India

5. Avoid close contacts like hugging and kissing every known-to. Rather express love and affection through your eyes at least till there is corona pandemic.
6. Don't re-use any mask. Side of mask towards your nose & mouth may change on reusing. Outer side may have viruses during its first use and if you change the side by mistake on re-use, you may get viruses in directly.
7. Mask should be changed every 4 – 6 hours as it may get wet of sweats, sneezes or saliva etc. and the wet area then helps the virus very easy way in.
8. Cloth mask may be used after wash with detergents again and again. But beware of side changing mistakes and time of 4 – 6 hrs. during each use.
9. Once alone in your office room, you may loosen your face mask to

make you comfortable till other visitor you allow in.

10. Don't think you are adult and healthy, so safe even without mask.
It looks good only till you find yourself critical.
11. Even if you are healthy, you might carry virus in your home,
enough to expose elderly and neonates to extreme risks.
12. Avoid attending gatherings or going to restaurants where there is
risk of losing necessary social distancing not only among
yourselves but also among staff working inside within a limited
space.
13. Apart from mask, you must use protective eye shields like goggles,
and face shields to minimize the risk of spread.
14. Persons whose work demands to be closer to the clients like
doctors, nurses and other health workers in covid treatment
areas, barbers in salon, beauticians in parlors, drivers in an
ambulance with covid patients etc., need PPE (Personal
Protective Equipment) kit.
15. A personal protective kit contains a coverall suit to cover from
head to toes, a protective large size goggle fitting tightly to the
skin around eyes, a triple layer or N95 mask as per required
category, gloves and a bag to collect all these at the end of work.
16. Distance issues, otherwise, may be solved by –
 - Patients through tele-consultation with doctors,
 - Doctors examining patients through selfie-sticked
stethoscope,
 - Customers purchasing goods through e-marketing,
 - Essential meetings through video conferencing,
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Corporate employees working from home,

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Academic institutions providing online classes,

•

Musicians co-opting music on Skype,

•

Interviews through video conferencing apps,

•

Shopkeepers using transparent curtains to create partition on front desk, etc.

17. Once got infected and found positive, do not panic. Anxiety worsens the condition manageable easily otherwise. Body's defense system (immunity) may easily overcome the infection in most of the cases.
18. Inform the District Surveillance Officer or the district authority of your positive report. He will advise you the first hand measures.
19. Get yourself isolated to a separate well ventilated room (to stop spread to other family members). You need to stay away from elderly people, pregnant women, children and persons with co-morbidities within the house as they all have low immunity; might get infected easily.
20. If another family member needs to stay in the same room, maintain a distance of 2 meter between the two.
21. Restrict movement within the house. Don't attend any social or religious gathering e.g. weddings, puja, condolences etc. - to just stop the chain of spread.

HOW THE COVID-19 HAS CHANGED THE WORLD FOREVER: BETTER OR WORSE

World has seen COMPLETE LOCKDOWNS first ever due to killer Covid-19, and it has impacted world with so many stigmas, thoughts and anxieties, better aspects and the worst feelings.

1. To start with better aspects, LOCKDOWN has kept families together for so long period first time, enjoying the warmth of family fully and leisurely.
2. It has given time to many to pamper their kids and peer; and to practice the hobbies whatever one wish with plenty of time and relaxation.
3. More than 17 drugs are under study for effects on Covid-19, however only two of them – Tab. Flavipiravir and injectable Remdesivir have been allowed by authorities for supervised treatment; and third, Tab. Hydroxychloroquine Sulphate (HCQS) (with Chloroquine sulphate as alternative) have been successful as prophylactic use.
4. However, Covid compelled to keep self at distance from others not known well. People affected with Covid-19 e.g. recovered persons, and frontline workers also being discriminated by neighbours.
5. Xenophobia with fear of persons from other place or country or even local strangers has taken people world over in grip, thinking of them being possible corona infected persons. People avoid being near any strangers. This may continue for years to come ahead and may change relations.



Xenophobia

Xenophobia is the dislike of people outside your community or country. It has increased worldwide against certain people since this crisis began. The impact of verbal xenophobia has become very negative especially during such uncertain times.

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 COVID KATHA

Source: MyGov Corona Newsdesk, Govt. of India

6. Covid-19 has changed how we think about death and the dead. Family members avoid touching the dead member from his family – confirmed covid or even suspected cases. Never happened earlier such scenario.
7. Covid-19 along with lockdowns have made many of population thinking negative about health and future of self and family.
8. STRICTLY NO to outings and entertainments during crisis may leave impact of not to mingle closely even in future to avoid multiple suspected contagious diseases already thought to be present in society.

Change in the world order in CORONA ERA

The geopolitical map of the world is again being redrawn as a result of the coronavirus pandemic appearing as the biggest challenge of the post world war era. World is at brink of 3rd world war like situation due to heavy loss of human life in nearly every large country along with similar loss to economies.

9. The Pandemic has drowned the world economy to the base of ocean of financial crisis. It will take years to normalize and will keep entrepreneurs fear of repetitions for decades.
10. It has lead governments of many countries cope with allegations of hiding the facts from arrival of disease to death figures to slowing down economy during the crisis. Many of them may be true or still suspected.
11. WHO has lost its credibility as an impartial stakeholder when it should have been the most important pillar at a time the world is

facing its most severe health emergency in a century. It will take time the world gets full faith in WHO again.

12. Technology has become the new frontier of cooperation and competition. It has connected the world as never before, and has changed the way individuals led their lives, companies conducted their businesses, and states interacted to other states.
13. The national lockdowns, prolonged interruptions in aviation, desperate search for PPEs, medical equipments and testing tools, and availability only of the local or national supply chains have all made nations' borders the most salient feature of world politics again. .
14. Each nation is revising its philosophical and political approach to the world, and finding its own place in it.
15. The fundamentals of international cooperation that were up in the air have changed completely after arrival of Covid-19 in each and every country world over, necessitating new cooperation network depending on how much one is helping and that also how much truthfully during the biggest crisis of century.

Values in the age of coronavirus

16. There may be drastic change in the context, traditions, customs, and behaviour over the time as collective community approach may lose importance.
17. The virtue of thinking how do I live a life and how we build a society are not the same as was in pre corona era.
18. Basis of consideration of politeness has now changed from unmasked actual behaviours earlier to masked face and keeping a distance irrespective of the actual reality.
19. As being in public involves risk, this is changing our attitudes about the dignity and worth of many occupations. Society is forced to understand more clearly which work is "key to giving or protecting life". People will remember those who enabled them buy food for the family or access to health facility in hour of

need.

FINAL DESTINY

Hope the effective vaccines come early and that too in plenty, and empower the humanity to protect itself from the killer very rapidly worldwide so that it's not too late to revive the habits, cultures, the social etiquettes and the economy we had in pre corona era. Let the normalcy prevail at the earliest.



Author – Dr. M. P. Chaurasia